L 25511-66

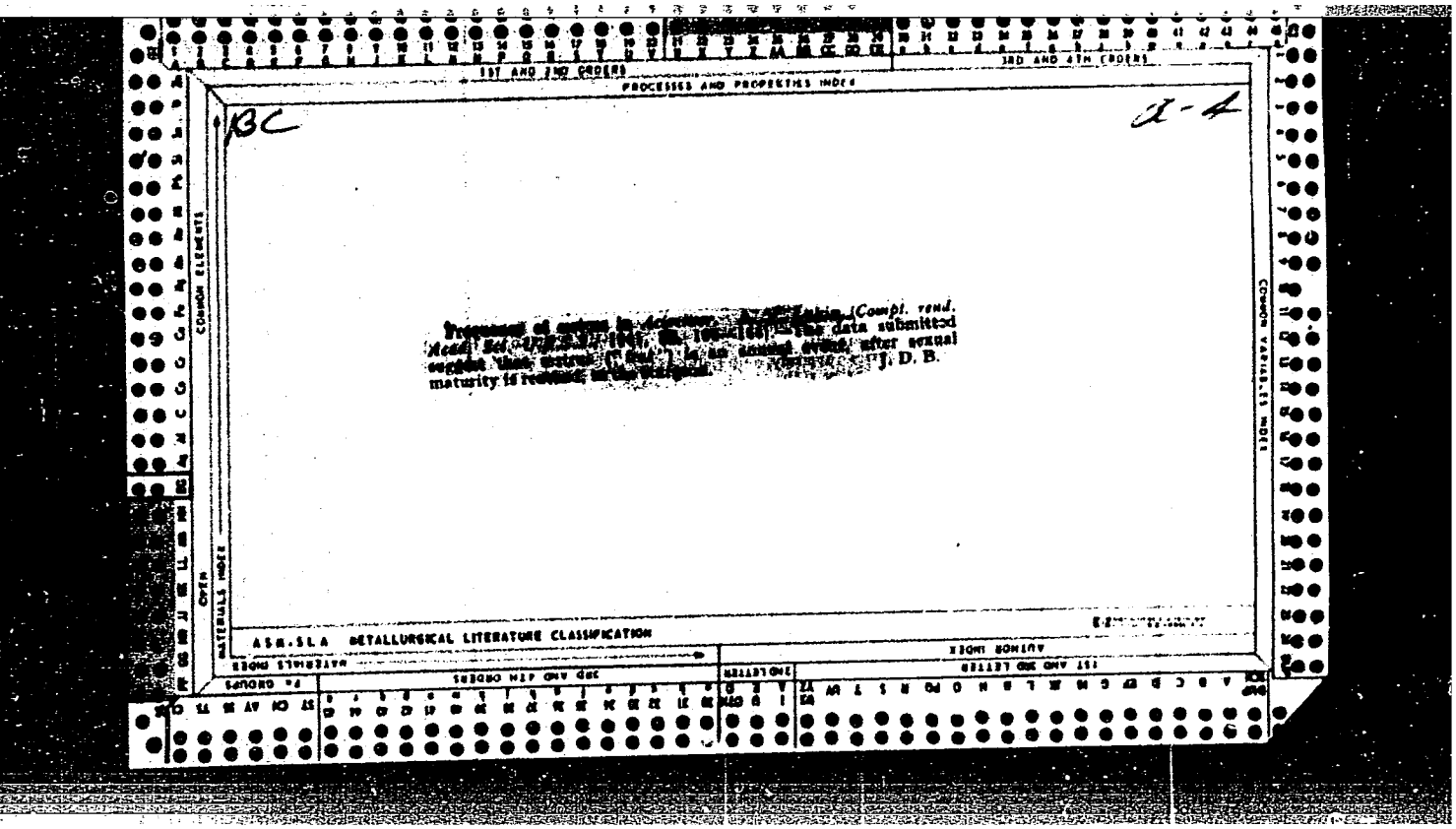
ACC NR: AP6011401

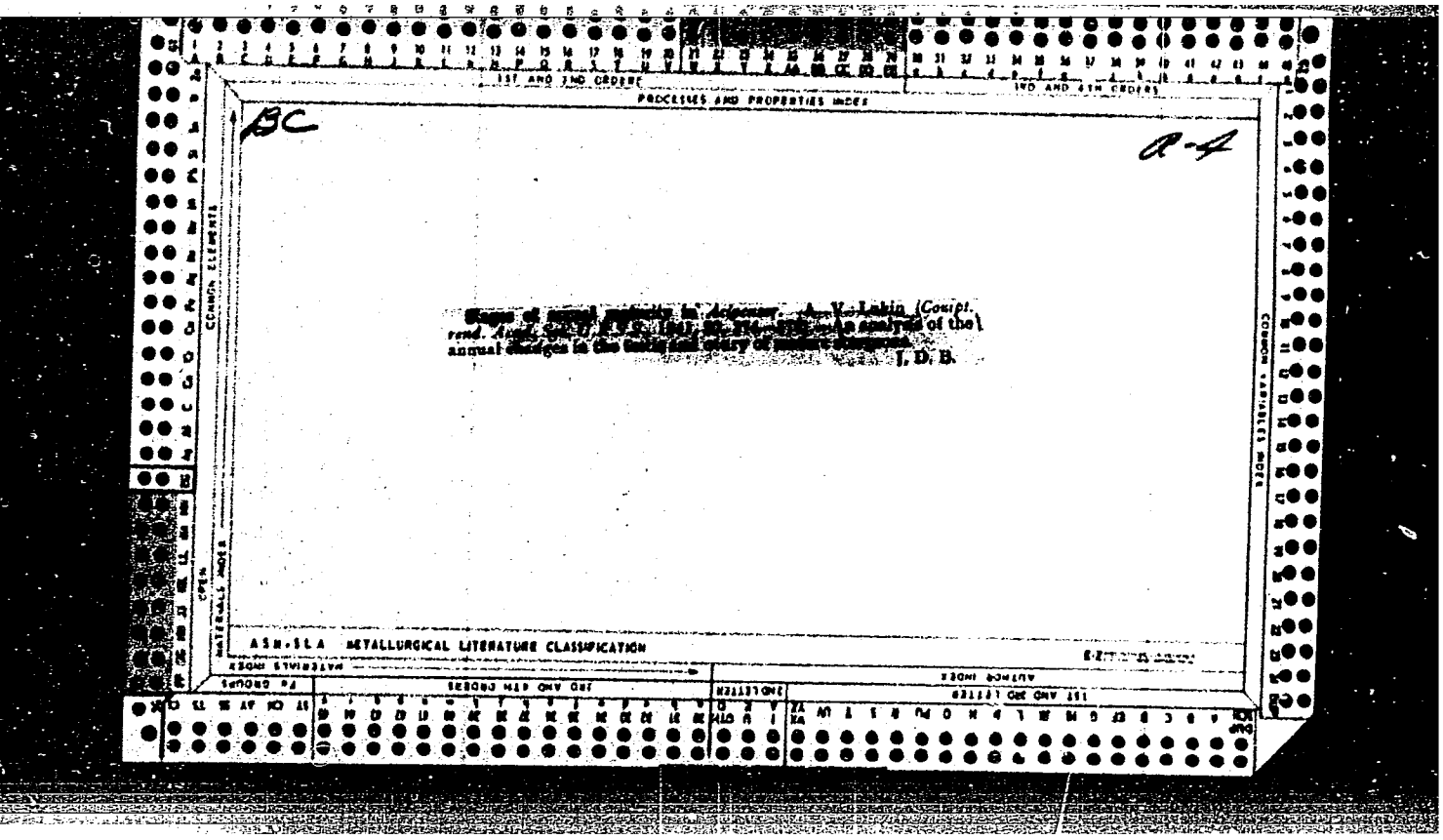
2

the contribution from collisions of the second kind was predominant. As a function of the helium partial pressure, the population of the $2s_2$ neon level went through a minimum at 1-2 mm Hg and a maximum at 4-6 mm Hg. The behavior of the 1.15μ ($2s_2$ - $2p_4$) neon line intensity as a function of helium pressure to be expected on the basis of the calculated populations is in agreement with the measurements of V.B.Znamenskiy.
The authors thank Yu.M.Kagan for his interest and valuable remarks, and V.B.Znamenskiy for kindly making available the results of his measurements. Orig. art. has: 4 formulas, 9 figures and 2 tables.

SUB CODE: 20 , SUBM DATE: 22May65 ORIG. REF: 007 OTH REF: 005

Card 3/3 PB





LUKIN, A. V.

Mbr., Tartar Sect. Ichthyologi al and Fresh-Water Fisciculture Inst., Kazan,-1941-.

"The Frequency of Spawn in the Sterlet," Dok. AN, 32, No. 2, 1941;

"The Stages of Sexual Maturity in the Sterlet,"

SO: Dok. AN, 32 No. 5, 1941.

LUKIN, A. V.

Lukin, A. V. - "Investigations of the status of supplies of sturgeon in the central Volga after the floods of 1939 through 1942", Trudy Tatar. otd-niya Vsesoyuz. nauch.-issled. in-ta ozerno-rech. ryb. khoz-va, Issue 4, 1948, p. 3-30, - Bibliog: 22 items.

SO: U-4110, 17 July 53, (Letopis 'Zhurnal 'nykh Statey, No. 19, 1949).

LUKIN, A. V.

Lukin, A. V. - "The fish compahy of the Sura River within the boundaries of the Chuvash ASSR", Trudy T tar. otd-niya Vsesoyuz. nauch.-issled. in-ta ozernorech. ryb. khoz-va, Issue 4, 1948, p. 31-97, - Bibliog: 33 items.

SO: U-4110, 17 July 53, (Letopis 'Zhurnal 'nykh Statey, No. 19, 1949).

LUKIN, A.V.

Age of sexual maturity and longevity of fishes as a factor in their struggle for existence. Izv.Kazan.fil.AN SSSR.Ser.biol.i sel'khoz.nauk no.1:63-79 '49. (MLRA 10:2)
(Volga River--Fishes)

LUKIN, A.V.

Role of temperature in the adaptation of the fish organism to the environmental conditions most favorable for reproduction. Izv. Kazan.fil.AN SSSR.Ser.biol.i sel'khoz.nauk no.1:81-86 '49.
(Volga River--Fishes) (MLRA 10:2)
(Temperature--Physiological effect)

LUKIN, A.V.; SHTEYNFEL'D, A.L.

Fertility of main commercial fishes of the middle Volga. Izv.Kazan. fil.AN SSSR.Ser.biol.i sel'khoz.nauk n.1:87-106 '49. (MLRA 10:2)
(Volga River--Fishes)

LUKIN, A. V.

"Relationship of the Fertility and Spawning Characteristics of Fish to their Habitat."

SO: Iz. Ak. Nauk SSSR, Ser. Biolog., 5, 1948., Mbr., Biology Inst, Kazan Affiliate, Acad. Sci., -c. 1948-.

"The Spawning of Fishes of the Central Volga," Priroda, No. 11, 1949.

LUKIN, A.V.; VASYANIN, K.I.; POPOV, Yu.K.

Inferior and undesirable fishes of the Tatar Republic, their significance in fishery and means for their economic utilization. Izv.Kazan. fil.AN SSSR.Ser.biol.i sel'khoz.nauk no.2:259-292 '50. (MLRA 10:2)
(Tatar A.S.S.R.--Fishes)

1. LUKIN, A. V. - Prof.

2. USSR (600)

4. Fish Culture

7. Standards and periods for fish feeding. Ryb. khoz. 28, no. 10, 1952.

9. Monthly List of Russian Accessions, Library of Congress, January, 1953. Unclassified.

LUKIN, A.V., professor.

Measures for building up a desirable fish stock in Kuybyshev Reservoir. Uch.zap.Kaz. un. 113 no.1:175-178 '53.

(MLRA 10:3)

(Kuybyshev Reservoir--Fishes)

LUKIN, A.V., doktor biologicheskikh nauk.

Ways for controlled developemtn of the ichthyofauna in reservoirs. Trudy sov.Ikht.kom. no.3:21-26 '54. (MLRA 7:8)

1. Tatarskoye otdeleniye Vsesoyuznogo nauchno-issledovatel'skogo instituta ozernogo i rechnogo rybnogo khozyaystva.
(Fishes)

LUKIN, A.V.

ARISTOVSKAYA, G.V.; LUKIN, A.V.

Raising young-of-the-year Kama carp in hatchery ponds. Uch.zap. Kaz.un. 115 no.8:191-204 '55. (MLRA 10:3)

1. Deystvitel'nyy chlen Obshchestva yestestvoispytateley.
(Carp)

LUKIN, A.V.

Basic characteristics of the development of fish stock in Kuybyshev Reservoir. Vop. ekol. 5:118-119 '62. (MIRA 16:6)

1. Tatarskoye otdeleniye Gosudarstvennogo nauchno-issledovatel'skogo instituta ozernogo i rechnogo rybnogo khozyaystva.
(Kuybyshev Reservoir--Fishes)

YERMAKOV, B.A.; LUKIN, A.V.; MAK, A.A.; PRILEZHAYEV, D.S.

Monopulse generation on $CaF_2:U^{3+}$ crystals. Pis'. v red. Zhur. eksper. i teoret. fiz. 2 no.8:380-383 O '65.
(MIRA 18:12)

1. Submitted August 31, 1965.

ACC NR: AP7008136 SOURCE CODE: UR/0057/67/037/002/0327/0329

AUTHORS: Afanas'yeva,V.L.; Lukin,A.V.; Mustafin,K.S.

ORG: none

TITLE: Energy distribution of electrons in a hollow cathode discharge in a neon-hydrogen mixture

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 37, no.2, 1967, 327-329

TOPIC TAGS: gas laser, neon, hydrogen, population inversion, electron distribution, energy distribution, cathode discharge, discharge tube

ABSTRACT: The authors have measured the energy distribution of electrons in hollow cathode discharges in neon and in a neon-hydrogen mixture. The measurements were undertaken in the search for an explanation for the difference between the behaviors of hydrogen and oxygen as quenching agents for the production of population inversion for the 2s → 2p transitions in neon lasers. The apparatus and experimental technique have been described elsewhere by the authors (ZhTF, 36, 526, 1966). The discharge tube was 1.2 cm in diameter and 30 cm long; the distance between the anodes was 10 cm. The total gas pressure was 1.1 mm Hg in both series of measurements, and when hydrogen was present its partial pressure was 0.3 mm Hg. The discharge current was varied from 0.05 to 0.4 A and the electron energy distribution function was recorded for electron energies up to 40 eV. In pure neon the electron energy distribution function decreased

Card 1/2 UDC: 533.933

ACC NR: AP7008136

monotonically from its first (and only) maximum at about 1.5 eV. In the neon-hydrogen mixture, however, the distribution function had a second maximum at about 20 eV and a corresponding minimum at about 16 eV when the discharge current was sufficiently high. The measured electron energy distribution functions were employed to calculate the populations of the $1s_5$, $2s_2$, and $2p_4$ neon levels, and the results are tabulated. The calculations indicated that in pure neon the $2p_4$ level is highly populated by step-wise excitation and there is no population inversion for the $2s_2 \rightarrow 2p_4$ transition, but that the presence of hydrogen depresses the $1s_5$ and $2p_4$ populations and enhances the $2s_2$ population, producing the population inversion. It is concluded that the presence of the second maximum in the electron energy distribution function in the neon-hydrogen mixture results in an increase in the population of the 2s neon levels and accounts for the advantage of hydrogen over oxygen as a quenching agent in neon lasers. The rapid rise of the lasing level of a neon-hydrogen laser with increasing discharge current is ascribed to the increase with increasing discharge current of the height of the second maximum of the electron energy distribution function. Orig. art. has: 1 formula, 2 figures and 1 table. [WA-14] [15]

SUB CODE: 20 / SUBM DATE: 03Dec65/ ORIG. REF: 005/ OTH REF: 001/

Card 2/2

LUKIN, A.V., inzh.

Siberian larch in protective belt planting. Put' i put. khoz. 9 no.7:29 '65. (MIRA 18:11)

LUKIN, A.V.

Dendrological treasures of the "Urusovo" park. Biul. Glav. bot. sada no.55:30-31 '64. (MIRA 18:11)

1. Chaplyginskoye lesnoye khozyaystvo, selo Troyekurovo Lipetskoy oblasti.

L 7691-66 EWA(k)/FBD/EWT(1)/EWT(m)/EPF(c)/EEC(k)-2/T/EWP(t)/EWP(k)/EWP(b)/
EWA(m)-2/EWA(h) SCTB/IJP(c) WG/JD/JW

ACC NR: AP5028019 SOURCE CODE: UR/0386/65/002/008/0380/0383

AUTHOR: Yermakov, B. A.; Lukin, A. V.; Mak, A. A.; Prilezhayev, D. S.

ORG: none

TITLE: Monopulse generation with $CaF_2:U^{3+}$ crystals

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu (Prilozheniye), v. 2, no. 8, 1965, 380-383

TOPIC TAGS: solid state laser, laser pulsations, laser

ABSTRACT: This is a continuation of earlier work (Optika i spektroskopiya v. 18, 353, 1965) in which attainment of monopulse generation in the 2.36μ infrared region with $CaF_2:Dy^{2+}$ was reported. In the present paper the authors report attainment of monopulse generation with $CaF_2:U^{3+}$ crystals at wavelengths 2.22 and 2.51 μ, using an experimental setup in which the crystals are cooled to 80—90K by a jet of nitrogen gas evaporated from the liquid phase (Fig. 1). A semitransparent coating with reflection coefficient R = 0.95 ± 0.6 was deposited on one end of the crystal. The cavity switching was by means of a rotating total internal-reflection prism. The pump-lamp ignition was synchronized with a photoelectric system coupled to the prism rotating at 1—2 x 10^4 rpm. The crystals used were 3—55 mm in diameter and 20—30 mm long. The radiation receiver was a Ge:Au photoresistance, and the generated energy was measured with a bolometer. The monopulse lasing at λ_3 = 2.22 μ was of the three-level type (Fig. 2a), with emission energy 0.1 x 10^{-3} J, corresponding to a pulse power of

Card 1/3

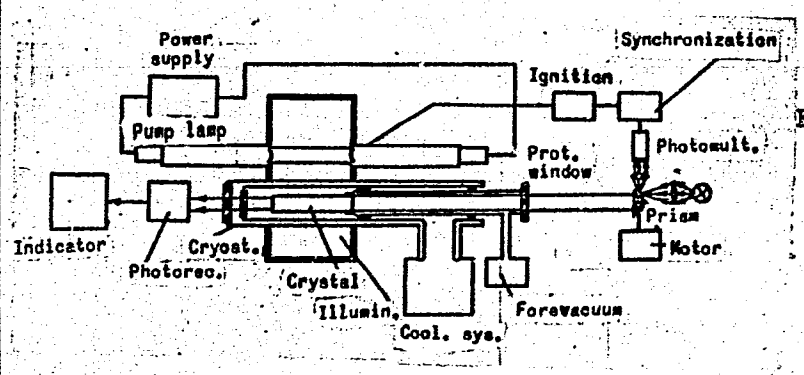


Fig. 1. Experimental setup

~4 x 10^3 W. In several crystals monopulse 4-level generation (λ_4 = 2.51 μ) was obtained, apparently, because of the high concentration of the activator in these crystals. The shape of the pulse was the same as in Fig. 2a. The maximum laser energy in the monopulse was 10^{-3} J in this case (pulse power ~5 x 10^4 W). At smaller prism

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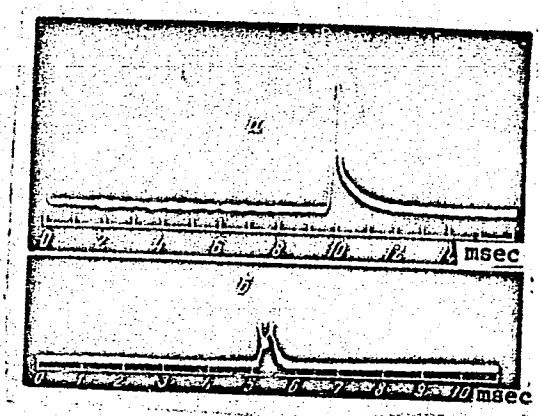
ACC NR: AP5028019



a

b

Fig. 2. Monopulse oscillograms

speeds, several laser pulses were obtained rather than one (Fig. 2b). Orig. art. has: 2 figures.

[02]

SUB CODE: EC/ SUBM DATE: 31Aug65/ ORIG REF: 002/ ATD PRESS: 4141

Card 3/3

L 27779-66 EEC(k)-2/EWA(h)/EWP(j)/EWP(k)/EWT(l)/EWT(m)/FBD/T/EWP(e) IJP(c)
ACC NR: AP6015592 RM/WH/WG SOURCE CODE: UR/0368/66/004/005/0410/0414

53
49
B

AUTHOR: Yermakov, B. A.; Lukin, A. V.

ORG: none

TITLE: Mechanism responsible for clearing of organic phototropic shutters used in ruby lasers 25

SOURCE: Zhurnal prikladnoy spektroskopii, v. 4, no. 5, 1966, 410-414

TOPIC TAGS: ruby laser, phthalocyanine, phototropism, light absorption

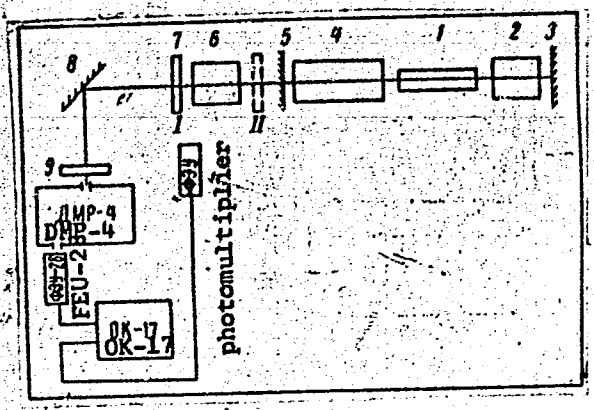
ABSTRACT: The authors consider reversible bleaching absorption under the effect of powerful light pulses through a solution of vanadyl phthalocyanine in nitrobenzene on two wavelengths lying within the absorption band for this solution. A block diagram of the experimental setup is shown in the figure. In the resonator of the ruby laser were a bleachable absorber (a solution of kryptocyanine in methanol) and cell 4 filled with benzene. Emission took place on wavelengths 649.3 mμ and 745 mμ (due to stimulated Raman scattering in benzene). The energy of the pulse from λ=745 mμ was about 15% of the energy on the ruby laser output. Monochromatic pulses were directed toward cell 6 with the solution to be studied through an attenuating filter selected in such a way that the intensity of emission on 745 mμ is insufficient to pass through the solution. The

20

UDC: 621.375.9

Card 1/3

L 27779-66
ACC NR: AP6015592



1--ruby crystal; 2--phototropic shutter; 3--opaque mirror; 4--cell with benzene; 5--output mirrors; 6--cell with solution to be studied; 7, 9--set of light filters; 8--rotating mirror

radiation passing through cell 6 and set of neutral filters 7 was directed to the input slit of monochromator DMR-4 tuned to a wavelength of 745 mμ. An FEU-28 photomultiplier was placed behind the output slit of the monochromator and the signal from the photo tube was recorded by an OK-17M oscillograph. When the set of neutral filters was placed in front of the cell (position II) and the emission intensity on λ=694.3 mμ was not sufficient to pass through the solution, a pulse was recorded on λ=745 mμ with an amplitude of 1/2-1/3 that of the pulse produced when the solution was exposed to radiation with λ=694.3 mμ with the set of filters 7 in position I. The results showed clearing of phthalocyanine solutions throughout the entire absorption band during exposure to intense monochromatic radiation. A theoretical explanation is given for the clearing effect based on changes in population in a three-level model for the solution. This three-level model for

Card 2/3

L 27779-66

ACC NR: AP6015592 4

photothropic substances may be used to determine the effect which spectroscopic characteristics of materials have on their efficiency as laser shutters which is important for synthesis or selection of materials for this purpose. In conclusion the authors thank I. F. Balashov, A. A. Mak and D. S. Prilezhayev for discussing the work and L. S. Dovgar for assistance with the calculations. Orig. art. has: 4 figures. [14]

SUB CODE: 20/ SUBM DATE: 03Jan66/ ORIG REF: 003/ OTH REF: 005/
ATD PRESS: 5103

Card 3/3

L 27727-66 EWT(m)/EWP(j) RM/WH

ACC NR: AP6015435 SOURCE CODE: UR/0051/66/020/005/0903/0905

AUTHOR: Dovger, L. S.; Yermakov, B. A.; Lukin, A. V.; Shklover, L. P.

47
45
B

ORG: none

TITLE: Effect of stimulated emission on the transmission coefficient of some organic dye/solution

SOURCE: Optika i spektroskopiya, v. 20, no. 5, 1966, 903-905

TOPIC TAGS: ruby laser, stimulated emission, optic transmission, dye chemical, organic cyanate compound

ABSTRACT: Experiments are conducted to determine how much emission power density is required in the resonator of a ruby laser for transillumination of various organic solutions. A block diagram and brief description of the experimental equipment are given. Curves are also given showing the transmission coefficient as a function of incident radiation power for solutions of vanadyl phthalocyanine in dimethyl formamide, kryptocyanine in methanol, vanadyl phthalocyanine in nitrobenzene and zirconium phthalocyanine in α-bromonaphthalene. These curves show that transmission of the specimens approaches 100% at a power density of the order of several Mw/cm^2 which corresponds to energy densities of 10^{17} quanta/cm^2 in a period of 10^{-8} sec. This indicates that transillumination of specimens in this class is basically due to transi-

UDC: 621.375.9 : 535.004.14

2

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ACC NR: AP6015435

2

tions from ground energy levels to singlet states with lifetimes of the order of $(2-8)\cdot10^{-9}$ sec. A reduction in solution concentration (increase in initial transmission) shifts the curve toward lower power densities without changing its shape. In conclusion the authors thank A. N. Terenin and O. D. Dmitriyevskiy for interest in the work. Orig. art. has: 3 figures. [14]

SUB CODE: 20/ SUBM DATE: 25Jun65/ ORIG REF: 001/ OTH REF: 003/

ATD PRESS: 5002

Card 2/2 BLG

LUKIN, A. Ya.

"Volcanic Deposits of the Miocene Epoch in the Carpathians," Dok AN SSSR, 83, No 5, 1952.

MIRA August 1952

LUKIN, A.Ya.

Mineralogical survey of terrigenous sediments of the lower Tortonian in the northwestern part of the outer zone of the cis-Carpathian frontal fault. Vop.min.osad.obr. 5:142-159 ' 58. (MIRA 12:3)
(Carpathian Mountain region--Mineralogy)

LUKIN, A.Ya.

Lithology of Tortonian deposits in the northwestern part of the outer zone of the cis-Carpathian frontal fault. Trudy VNIGNI no.12: 69-79 '58. (MIRA 12:3)
(Carpathian Mountain region--Petrology)

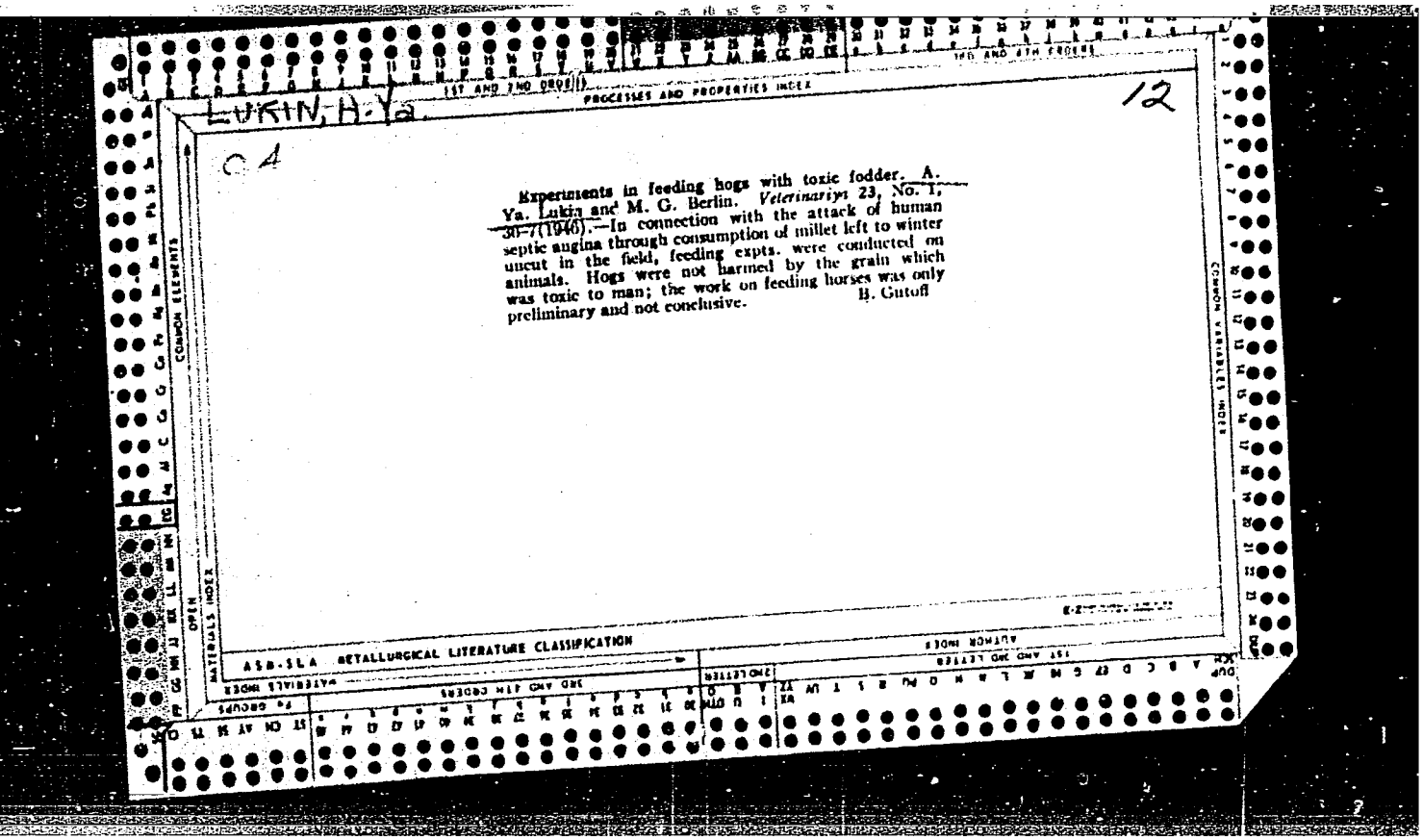
LUKIN, A.Ya.

Lithology of Pistyn' conglomerates in the cis-Carpathian region.
Trudy UkrNIGRI no.1:57-67 '59. (MIRA 12:12)
(Carpathian Mountain region--Conglomerates)

LUKIN, [A.Ya.]

"An Experiment with the Liquidation of Foot-and-Mouth Disease in its Incipient Stages. Brands (in Ukrainian). Vet. sprava, 1939, No 10. (Bibliography from article Foot and Mouth Disease by A. L. Skomorokhov, State Publishing House for Agricultural Literature, Moscow/Leningrad 1947.)

SO: U-1625, 11 January 1952,



PA 61T61

LUKIN, A. YA., PROF

USSR/Medicine - Animals - Diseases Jan 1948
Medicine - Beets

"The Garden Beet as a Cause of Mass Poisoning of Swine, the Etiology of the Poisoning, and a Method of Treatment," Prof A. Ya. Lukin, 3 pp

"Veter" No 1

Use of methylene blue is recommended as radical means of treating methemoglobin resulting from nitrate poisoning. Doses for swine were 0.01-0.02 grams of methylene blue for each kilogram of weight of swine. Doses were administered in solution.

61T61

[redacted]

LUKIN, A.Ya.

Mineralogy of the Buglovka layer of the southwestern margin of the Russian Platform. Trudy UkrNIGRI no.5:302-308 '63.
(MIRA 18:3)

LUKIN, A.Ye.

Epigenetic zoning of rocks of the Shigneta series in the Ona River area of the Western Sayan Mountains. Dokl. AN SSSR 151 no.1: 178-180 Jl '63. (MIRA 16:9)

1. Khar'kovskiy gosudarstvennyy universitet im. A.M.Gor'kogo. Predstavleno akademikom N.M.Strakhovym.
(Sayan Mountains--Rocks)

GRITSENKO, A., gornyy master; KACHURA, A.; LUKIN, B.

Is there a need for special gas inspectors in mines? Sov.shakht. 10 no.5:17 My '61. (MIRA 14:9)

1. Shakhta no.2 "Kontarnaya" tresta Shakhterskantratsit." 2. Rabochiy shakhty no.8 kombinata Stalinugol'. 3. Desyatnik ventilyatsii shakhty "Polysayevskaya-1" kombinata Kuzbassugol'.
(Mine gases)

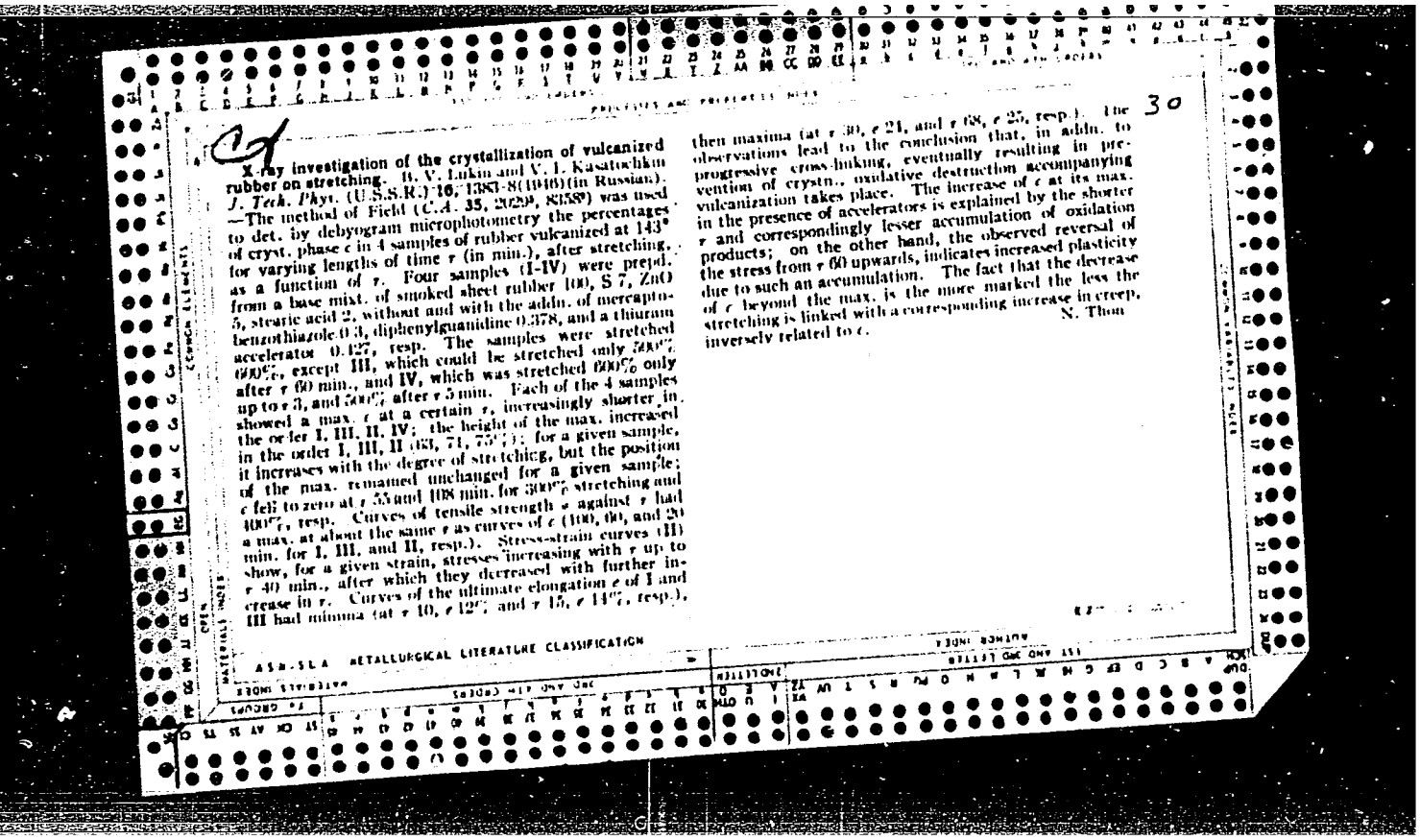
DMITRASHKO, I.; LUKIN, B.

Using a piecework bonus wage system on state farms. Biul. nauch. inform.: trud i zar. plata 5 no.2:45-50 '62. (MIRA 15:2)
(Agricultural wages)

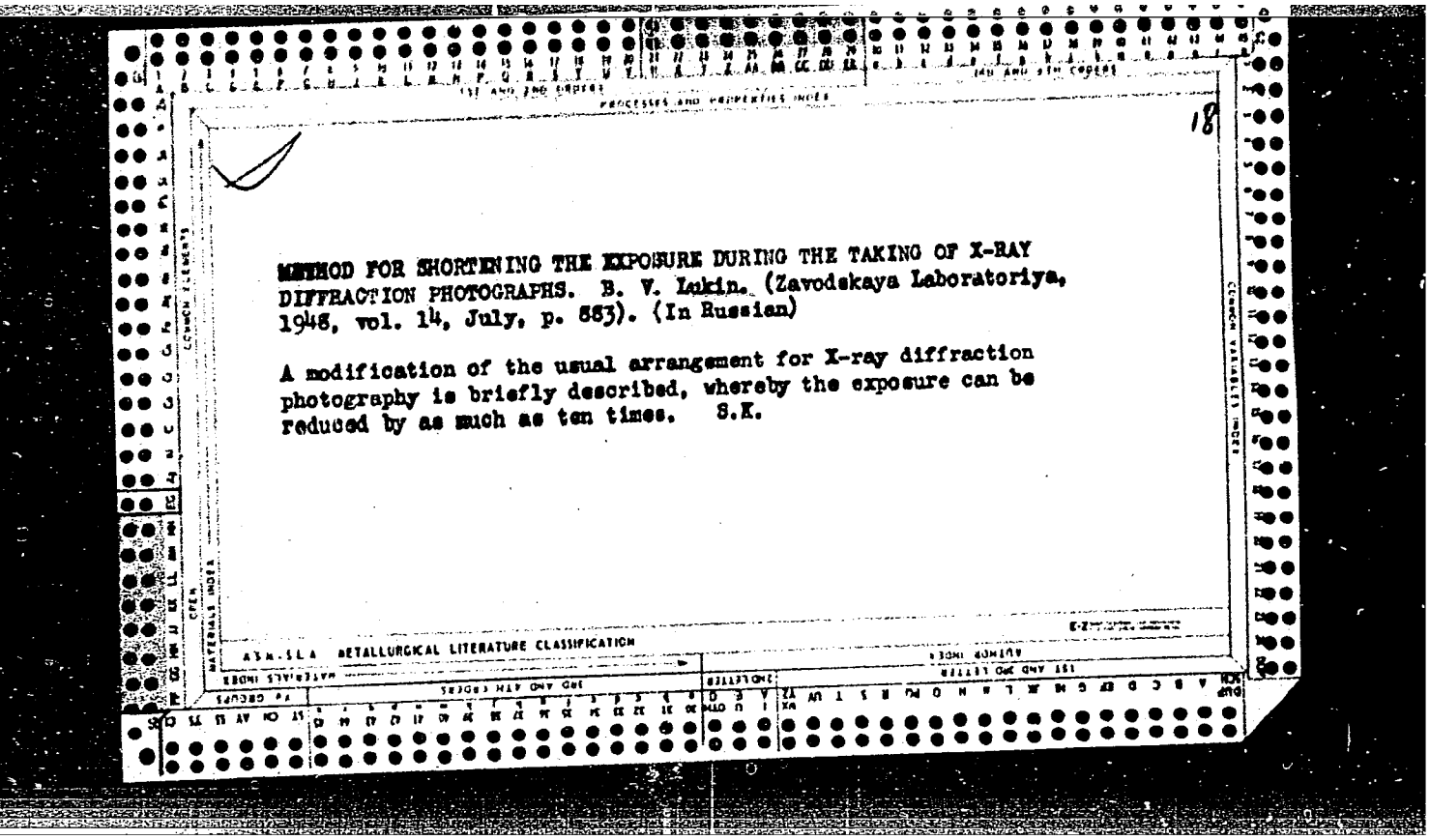
VERNYY, A.N. Prinimal uchastiye: LUKIN, B.S., slesar'; MAMONTOVA, O.K., red.; FILATOVA, G.M., tekhn. red.

[Automatic equipment for liqueur and vodka distilleries]Avtomaticheskoe oborudovanie likero-vodochnykh zavodov; rukovodstvo po ekspluatatsii i naladke. Blagoveshchensk, Amurskoe knizhnoe izd-vo, 1960. 62 p. (MIRA 15:12)

1. Russia (1917- R.S.F.S.R.)Amurskiy ekonomicheskiy administrativnyy rayon. Zavodoupravleniye spirtovodochnykh predpriyatiy. 2. Glavnyy inzhener zavodoupravleniya spirtovodochnykh predpriyatiy Amurskogo sovnarkhoza (for Vernyy).
(Amur Province—Distilling industries—Equipment and supplies)
(Machinery, Automatic)

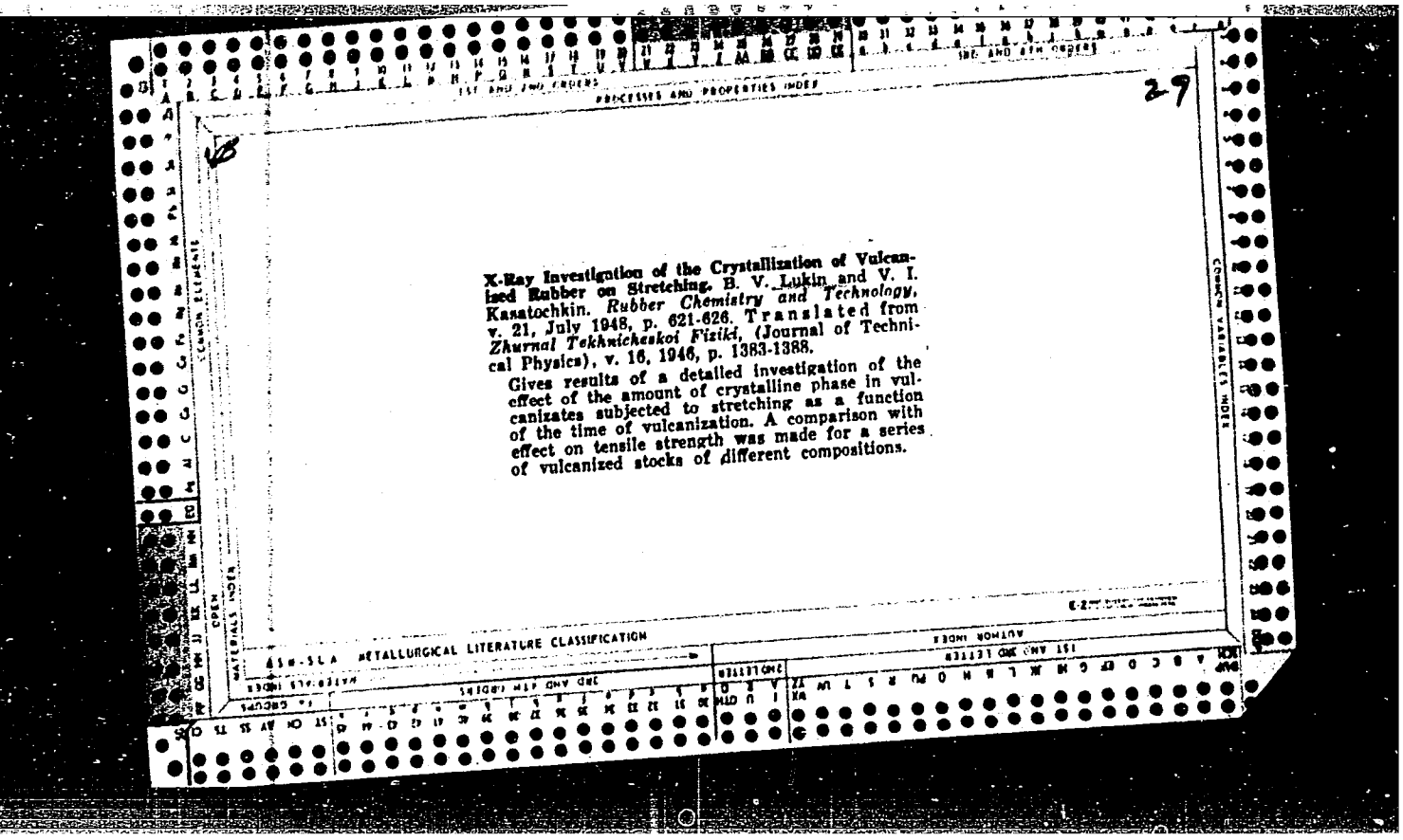


X-ray investigation of the crystallization of vulcanized rubber on stretching. B. V. Lukin and V. I. Kasatochkin. *J. Tech. Phys.* (U.S.S.R.) 16, 1383-8(1946)(in Russian). —The method of Field (*C.A.* 35, 2029⁹, 8358⁹) was used to det. by debyogram microphotometry the percentages of cryst. phase c in 4 samples of rubber vulcanized at 143° for varying lengths of time τ (in min.), after stretching, as a function of τ. Four samples (I-IV) were prepd. from a base mixt. of smoked sheet rubber 100, S 7, ZnO 5, stearic acid 2, without and with the addn. of mercaptobenzothiazole 0.3, diphenylguanidine 0.378, and a thiuram accelerator 0.127, resp. The samples were stretched 500%, 600%, except III, which could be stretched only 500% after τ 60 min., and IV, which was stretched 600% only up to τ 3, and 500% after τ 5 min. Each of the 4 samples showed a max. c at a certain τ, increasingly shorter in the order I, III, II, IV; the height of the max. increased in the order I, III, II (63, 71, 75%); for a given sample, it increases with the degree of stretching, but the position of the max. remained unchanged for a given sample; c fell to zero at τ 55 and 108 min. for 300% stretching and 400%, resp. Curves of tensile strength s against τ had a max. at about the same τ as curves of c (100, 80, and 30 min. for I, III, and II, resp.). Stress-strain curves (III) show, for a given strain, stresses increasing with τ up to τ 40 min., after which they decreased with further increase in τ. Curves of the ultimate elongation e of I and III had minima (at τ 10, e 12%, and τ 15, e 14%, resp.), then maxima (at τ 30, e 21, and τ 68, e 25, resp.). The observations lead to the conclusion that, in addn. to progressive cross-linking, eventually resulting in prevention of crystn., oxidative destruction accompanying vulcanization takes place. The increase of c at its max. in the presence of accelerators is explained by the shorter τ and correspondingly lesser accumulation of oxidation products; on the other hand, the observed reversal of the stress from τ 60 upwards, indicates increased plasticity due to such an accumulation. The fact that the decrease of c beyond the max. is the more marked the less the stretching is linked with a corresponding increase in creep, inversely related to c. N. Thon



METHOD FOR SHORTENING THE EXPOSURE DURING THE TAKING OF X-RAY DIFFRACTION PHOTOGRAPHS. B. V. Lukin. (Zavodskaya Laboratoriya, 1948, vol. 14, July, p. 863). (In Russian)

A modification of the usual arrangement for X-ray diffraction photography is briefly described, whereby the exposure can be reduced by as much as ten times. S.K.



X-Ray Investigation of the Crystallization of Vulcanized Rubber on Stretching. B. V. Lukin and V. I. Kasatochkin. *Rubber Chemistry and Technology*, v. 21, July 1948, p. 621-626. Translated from *Zhurnal Tekhnicheskoi Fiziki*, (Journal of Technical Physics), v. 16, 1946, p. 1383-1388.

Gives results of a detailed investigation of the effect of the amount of crystalline phase in vulcanizates subjected to stretching as a function of the time of vulcanization. A comparison with effect on tensile strength was made for a series of vulcanized stocks of different compositions.

LUKIN, B. V.

"X-RAY Investigation of Vulcanization's Effect on the Molecular Structure and Physiconechanical Properties of Natural Rubber." Thesis for degree of Cand. Chemical Sci. Sub 16 May 49, Moscow Inst. of Fine Chemical Technology imeni M. V. Lomonosov.

Summary 82, 18 Dec. 52, Dissertations Presented for Degrees in Science and Engineering in Moscow in 1949. From Vechernyaya Moskva, Jan-Dec 1949.

LUKIN, B. V.

Röntgenographic study of the vulcanization process. V. I. Kasatochkin and B. V. Lukin. *Izdatel'stvo i Oblasti Vysokomolekul. Soedinenii, Akad. Nauk S.S.S.R.* 1949, 289–96. —An x-ray study was made of the amorphous phase of rubber and its crystn. by elongation, for various stages of vulcanization. Natural rubber (smoked sheet) gives a pattern which shows a sharp reduction of intensity of the amorphous ring with increase of crystallinity, although the shape of the curve differs from that shown by Hauser and Mark (*C.A.* 20, 3360). Vulcanized specimens (with S and 2-mercaptobenzothiazole) show a const. intensity of the amorphous ring over a certain range of elongations, with progressive increase of intensity of the cryst. interference. This indicates that the cryst. phase arises from that part of the amorphous phase which does not take part in x-ray scattering in the form of the amorphous ring, but rather simulates gaseous scattering. This probably represents parts of chains that are not held together by van der Waal's forces, owing to peculiarities of orientation of chain links. Specimens of the same thickness give different intensities of the amorphous ring: liquid paraffin 0.26, plasticized smoked-sheet rubber 0.24, ordinary smoked-sheet rubber 0.15–0.19, vulcanized rubber 0.12. On elongation of the vulcanized specimens and before the appearance of cryst. interference, the relative intensity of the amorphous ring increases along the line of the diagrammatic equator; this vanishes when the cryst. pattern appears; meridianal textures appear at this point, but are very weak. Mixts. at low degree of vulcanization show no crystn. on elongation; with increase of vulcanization (7–10% S) the 2nd-stage lattice formation through S bridges also suppresses crystn., owing to reduced mobility. Specimens with 7% S show a max. of crystallinity on 400–600% elongation in early stages of vulcanization; in later stages, the crystallinity declines steadily. Heating smoked-sheet rubber in a vulcanization press 1 hr. (especially during the initial period) greatly reduces the ability to form cryst. patterns on elongation. This can be explained by oxidative destruction. However, more prolonged heating again restores the crystn. ability, without change of tensile strength, but with increase of creep. An x-ray study at small incident angles made on vulcanized specimens and at rest and elongated 500% shows a continuous diffuse pattern of the gaseous type; this does not seem to be explainable by the action of the cryst. areas.

G. M. Kosolapoff

30

C.A.

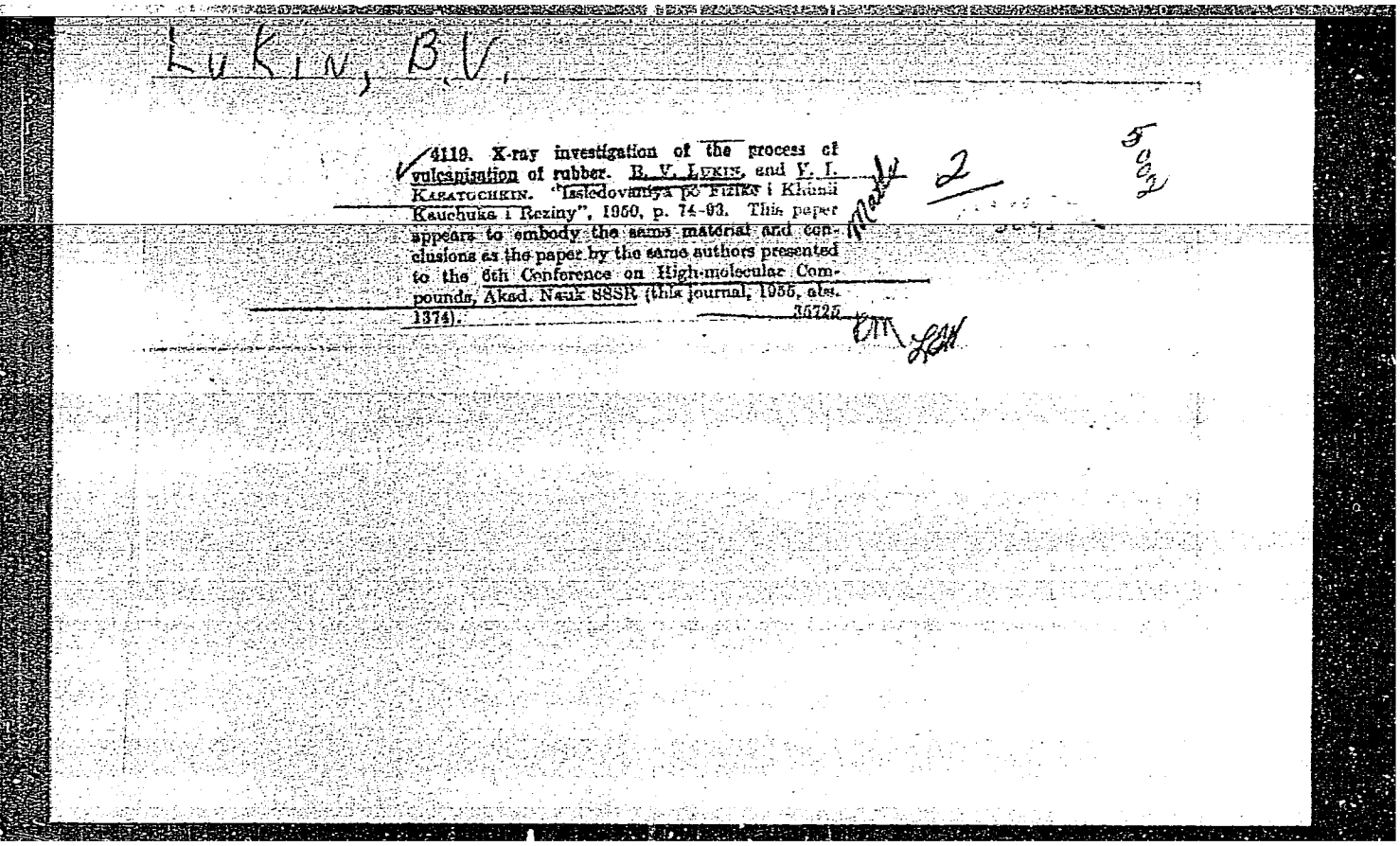
An x ray investigation of the crystallization of vulcanized rubber on stretching. III. V. I. Kasatochkin and B. V. Lukin. *Zhur. Tekh. Fiz.* 19, 76-85(1949); cf. *C.A.* 41, 5747d.—In smoked sheet, without previous plasticization and contg. no fillers, vulcanized at 143° for lengths of time τ from 0 to 60 min., and stretched 500%, the fraction f of the cryst. phase decreases regularly, from 70 to 50%, with increasing τ because of destructive oxidation. Within the same limits, the mol. wt. (by viscosity of dil. solns.) falls from 70,000 to below 40,000, and the creep, measured under 1 kg./sq. cm. at 18° in 50 hrs., rises from 150 to 450%. The tensile strength σ falls linearly from 18 to 12 kg./sq. cm. With smoked sheet (100) + S (2), ZnO (5), stearic acid (2), and mercaptobenzothiazole (0.8), f rises steeply to a max. within the 1st 40 min., then falls off slightly and remains const. with further increasing τ. The curve of σ has a similar shape, except that σ falls off slightly with long τ. This latter effect is even more pronounced with smoked sheet with the same percentages of S, ZnO, and stearic acid, but with thiuram (0.854) or diphenylguanidine (0.756) instead of mercaptobenzothiazole. In smoked sheet with the latter, but with 7 instead of 2% S, the max. f is sharper, and its fall with further prolonged τ somewhat more marked. The factor responsible for the decrease of f is evidently the formation of S bridges which reduce the mobility of the mols. and thus counteract crystn.; with a low S content of 2%, the process of spatial network formation is practically completed at the optimum, and has no further effect on more prolonged τ. The subsequent fall of both f and σ is attributed to the plasticizing action of the oxidation products of rubber. This is borne out by the observed fall of the modulus of elasticity with τ prolonged beyond the optimum in mixts. with 2% S. This is not so with 7% S, where prolonged τ results in further increasing modulus, owing to continued growth of bridges. Addn. of 30% plasticizer lowers f at all stages of vulcanization; dibutyl phthalate has a stronger f-lowering effect than mazut. The tensile strength σ is an increasing function of f over the whole range of vulcanization, but, for a given mixt., each f is assocd. with 2 values of σ, one corresponding to the 1st phase, the other to the 2nd phase of the vulcanization (beyond the optimum). This indicates a different nature of the strength in the 2 phases. The amt. of bound S increases with time at the initial stages of the vulcanization, but the material still remains plastic as long as the spatial network has not spread throughout its whole mass. This may account for the fact that a relatively small change in bound S can be accompanied by a relatively large change of f. Crystn. of vulcanizates in the 2nd phase, beyond the optimum, is governed by the d. of the spatial network. More completely crystd. vulcanizates have a greater σ, owing to the greater no. of chains. However, high tensile strength may still be present, even though crystals may have disappeared almost completely; in that case, σ is detd. by oriented chains. Inhibition of crystn by bound S is due to the noncoincidence of the C—S bond distance and the lattice period of cryst. rubber. Nonbridge S lowers the crystallizability by occupying points which otherwise might have formed part of the crystal.

N. Thon

CA

Molecular structure and properties of rubber. V. I. Kasatochkin and B. V. Lukin. *Doklady Akad. Nauk S.S.S.R.* **67**, 683-6(1949).—In smoked-sheet rubber, vulcanized NK-1 (smoked sheet 100, ZnO 5, stearic acid 2, S 7, mercaptobenzothiazole 0.3), and vulcanized NK-5 (100, 5, 2, 2, 0.6), the intensity of the amorphous ring in x-ray diffraction was const. over a wide range of extension, notwithstanding the steady increase in intensity of the spots corresponding to an increase in the amt. of the cryst. phase up to 60%. This constancy of the intensity of the amorphous ring on stretching is interpreted as an indication that the crystals are not formed from the "liquid" part of the amorphous rubber, but from what is termed its "gaseous" part, presumed to consist of free fragments of mol. chains. The considerable change in the d. of rubber on crystn. is in accord with this idea. The "gaseous" part of the amorphous rubber, which should scatter x-rays as a gas, dets. the elastic properties of rubber. Comparison of the intensities of the amorphous ring of 3 samples of different elasticities, plasticized and unplasticized smoked sheet, and a highly elastic vulcanizate NK-31 (strength 163 kg./sq. cm., relative elongation 900%, creep under 20 kg./sq. cm. in 50 hrs., 5%), as a function of the thickness (up to 1.0 mm.), showed the highest intensities for low-elasticity and high-plasticity plasticized smoked sheet, lowest intensities for the very highly elastic NK-31, and intermediate values for the unplasticized smoked sheet.

N. Thon



LUKIN, B.V.

4119. X-ray investigation of the process of vulcanization of rubber. B. V. LUKIN, and V. I. KASATOCHKIN. "Issledovaniya po Fizike i Khimii Kauchuka i Reziny", 1960, p. 74-93. This paper appears to embody the same material and conclusions as the paper by the same authors presented to the 6th Conference on High-molecular Compounds, Akad. Nauk SSSR (this journal, 1956, abs. 1374). 35725

Rubber Abs.
Vol. 31
Nov. 1953
Vulcanised
Natural
Rubber

4664. X-ray investigation of the crystallisation of vulcanized rubber on stretching. IV. V. I. KASATOCHKIN and B. V. LUKIN. Zhur. Tekh. Fiz., 1950, 20, 1160-6; Chem. Abs., 1953, 47, 7811. Cf. this journal, 1950, 28, 565. The number of crystals was determined as a function of the period of vulcanisation for smoked sheet rubber stretched 400% without and with carbon black as filler, using varying proportions of carbon black, sulphur, stearic acid, zinc oxide, MBT, and thiuram. Without carbon black, crystallisation began to be apparent after 10 min., growing rapidly at first, slowing down, reaching a 60% maximum after 60 min., remaining constant to 220 min., and falling to zero at 300 min. Using 30% carbon black, maximum was reached very soon after the beginning of vulcanisation, fell slightly within 20 min., and then reached a constant value of 60%. This checks with the relationship between the content of rubber crystals and the content of bound sulphur. Carbon black reduced the modulus of elasticity. Without black, tension strength increased but little with the amount of sulphur crystals; with black present, it was small while the sulphur content was small, but became four times as large when the sulphur content reached its optimum. Carbon black also increased the crystallisation of plasticised rubber.

(over)

The elongation of the X-ray spots indicates that carbon black makes the orientation of the crystals less definite. With carbon black, thiuram makes the rubber crystals more nearly perfect, the explanation of this effect by adsorption of the rubber mol, chains to the carbon particle surface being confirmed by the fact that carbon causes crystallisation of the rubber even in the absence of vulcanising agents, and also by the difference between the crystal orientation and the direction of the mechanical forces in the stretched rubber. The orientation of the mols. in the direction of elongation, coupled with restricted rotation due to adsorption, creates an effect of single-dimensional crystals. Two-dimensional crystals are likely to be formed at the surfaces of adsorption.

63423

LUKIN, B. V.

PA 187T95

USSR/Physics - X-ray Analysis, Rubber Mar/Apr 51

"The X-ray Analysis of the Molecular Structure of Rubber," V. I. Kasatochkin, B. V. Lukin, Sc. Res Inst of Tire Ind

"Iz Ak Nauk SSSR, Ser Fiz" Vol XV, No 2, pp 209-217

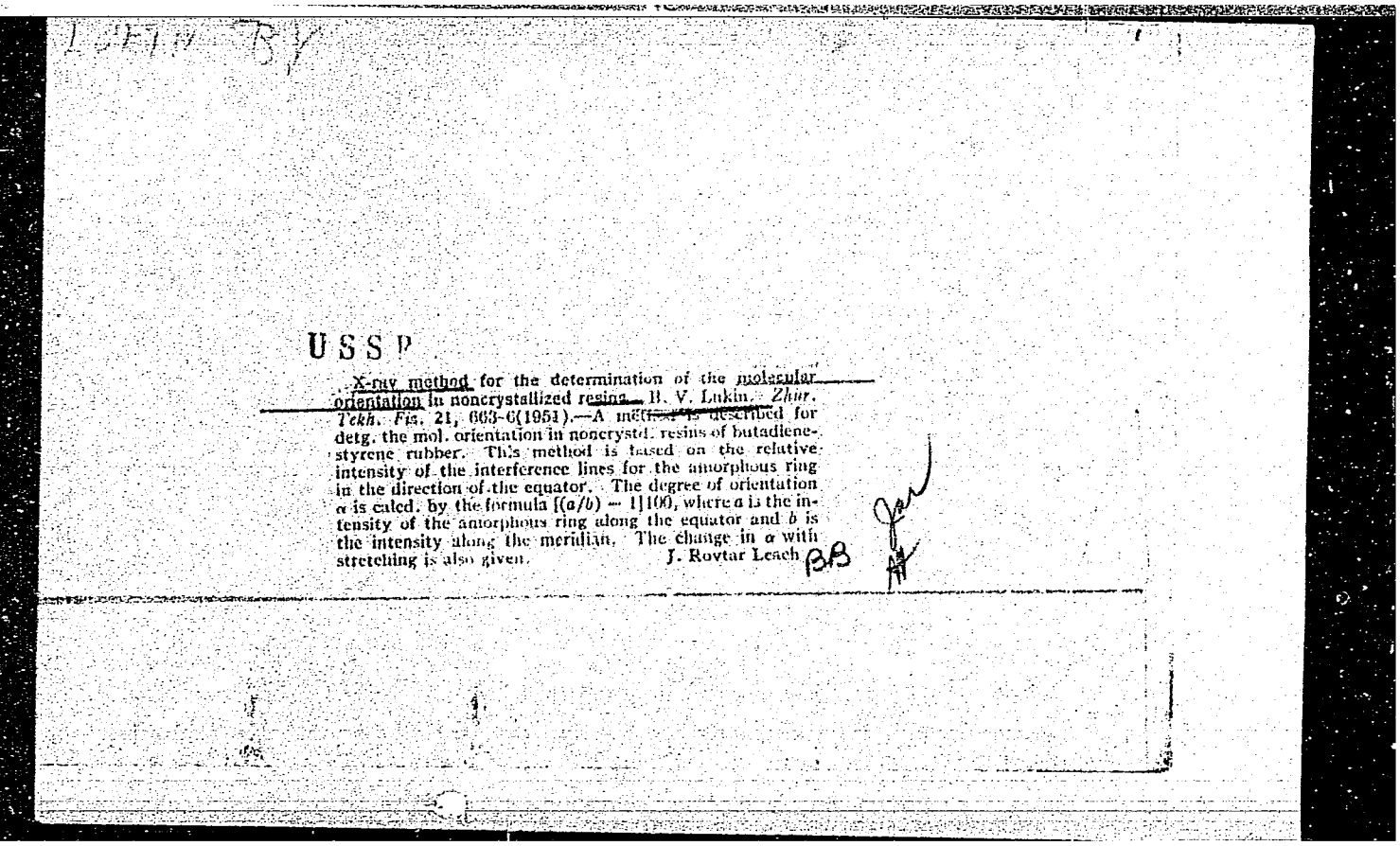
Authors lectured on scattering of X-rays in amorphous caoutchouc, variations in mol structure of caoutchouc under fatigue and wear, crystn of filler vulcanizers of rubber, and mol orientation of filler vulcanizers of synthetic rubber. The following participated in

LC 187T95

USSR/Physics - X-ray Analysic, Rubber Mar/Apr 51
(Contd)

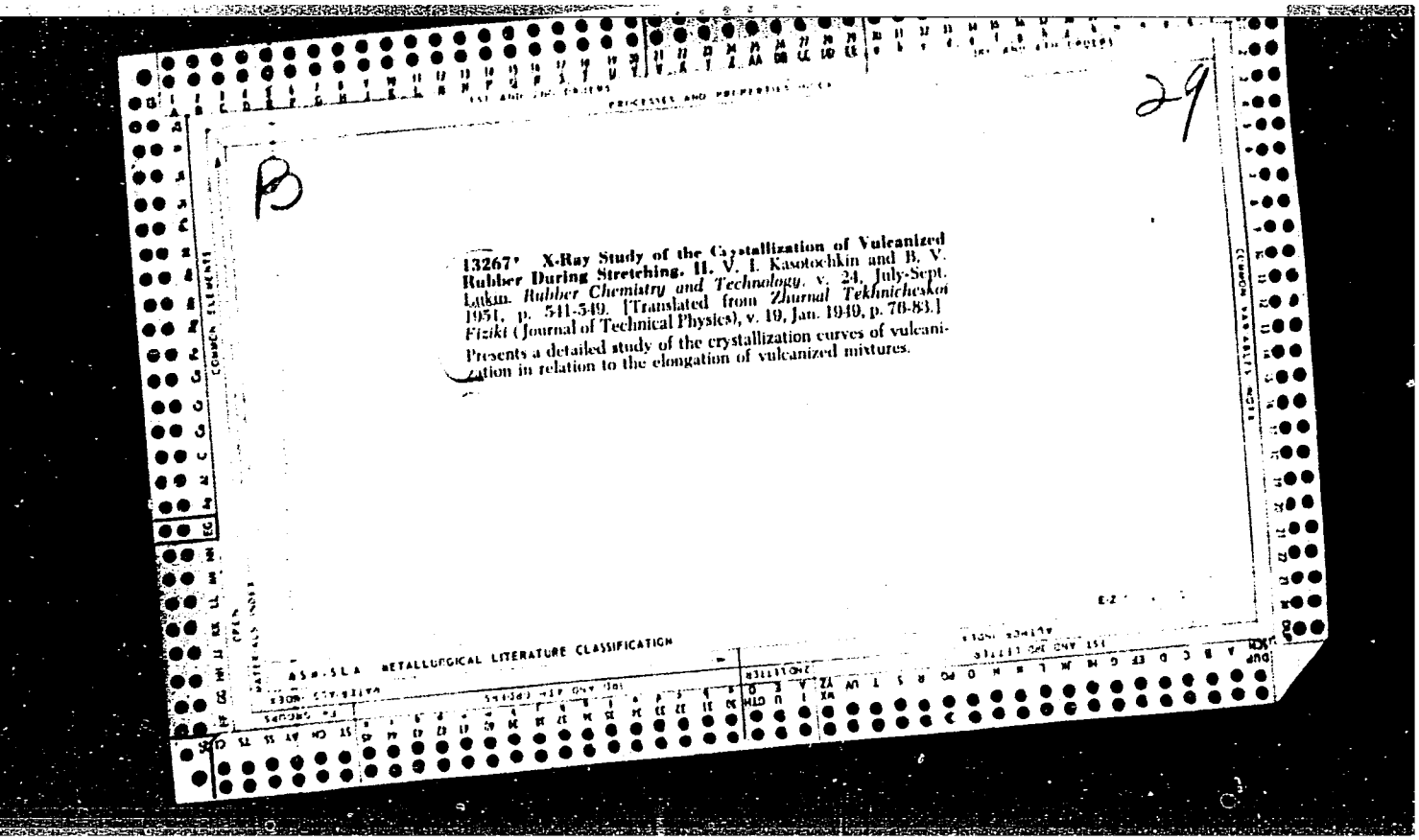
discussions after the lecture: Z. G. Pinsker, I. Kasatochkin, V. I. Kitaygorodskiy, N. S. Kostetskaya, V. L. Karpov, V. I. Danilov. Lecture read at 3d All-Union Conference on Use of X-rays in Study of Materials held 19 - 24 Jun 50 in Leningrad.

LC 187T95



USSR

X-ray method for the determination of the molecular orientation in noncrystallized resins. B. V. Lukin. *Zhur. Tekh. Fiz.* 21, 663-6(1951).—A method is described for detg. the mol. orientation in noncrystd. resins of butadiene-styrene rubber. This method is based on the relative intensity of the interference lines for the amorphous ring in the direction of the equator. The degree of orientation α is calcd. by the formula $[(a/b) - 1]100$, where a is the intensity of the amorphous ring along the equator and b is the intensity along the meridian. The change in α with stretching is also given. J. Rovtar Leach



13267* X-Ray Study of the Crystallization of Vulcanized Rubber During Stretching. II. V. I. Kasotochkin and B. V. Lukin. *Rubber Chemistry and Technology*, v. 24, July-Sept. 1951, p. 541-549. [Translated from *Zhurnal Tekhnicheskoi Fiziki* (Journal of Technical Physics), v. 19, Jan. 1949, p. 76-83.]

Presents a detailed study of the crystallization curves of vulcanization in relation to the elongation of vulcanized mixtures.

CA

Molecular aggregation in amorphous polymers. V. I. Kasatochkin and B. V. Lukin. *Doklady Akad. Nauk S.S.S.R.* 77, 81–4(1951).—The previously given (*C.A.* 44, 2390b) interpretation of the structure of amorphous rubber as consisting of a liquid-type part, giving an interference max. of the scattered intensity of x-rays as a function of the scattering angle (due to near-range order), and a disordered gas-type part, is further corroborated by the change of the scattering intensity curves with the temp. With rising temp. (20, 90, 120°), the max. becomes increasingly flatter, and the intensity in the range of small scattering angles increases. The curves are very strongly reminiscent of Noll's (*Phys. Rev.* 42, 338(1942)) curves for the x-ray scattering intensity of H_2O at different temps., with the max. disappearing completely at 210°. The total scattering intensity $I = I_g + I_l$, where the subscripts g and l refer to "gaseous" and the "liquid" part, resp. The former is $I_g = PN_gF^2$, where F = structure amplitude of scattering by single links of the mol. chains (detd. by interference of the radiation coherently scattered by the atoms of the same chain link), N_g = no. of links constituting the "gaseous" part, and $P = (1 + \cos^2 2\theta)/2$, where θ = scattering angle. The intensity I_l of the "liquid" part, detd. by interference of the radiation coherently scattered by links of neighboring chains, as given by Debye's theory of scattering in liquids, is $I_l = PN_lF^2A$, where $A = [1 - \int_0^\infty 4\pi r^2\rho(1 - W)(\sin sr/sr)dr$, where W = probability of neighboring disposition of links, ρ = mean d., $s = (4\pi \sin\theta)/\lambda$, and $4\pi r^2\rho dr$ = mass of a spherical shell of thickness dr at a distance r from a given link. In the case of complete disorder, $W = 1$, and $I = PNF^2$, where N = total no. of links. For high θ, the integral tends to zero, and I tends to the above value for a completely disordered "gaseous" state. For small θ, the integral tends to unity, $I_l = 0$, and $I = I_g$. The coexistence of the "gas" and the "liquid" phases in an amorphous polymer is due to the difficulty of close packing of all links of neighboring mol. chains. The same cause underlies the incomplete crystn. of polymers, as evidenced by x-rays.

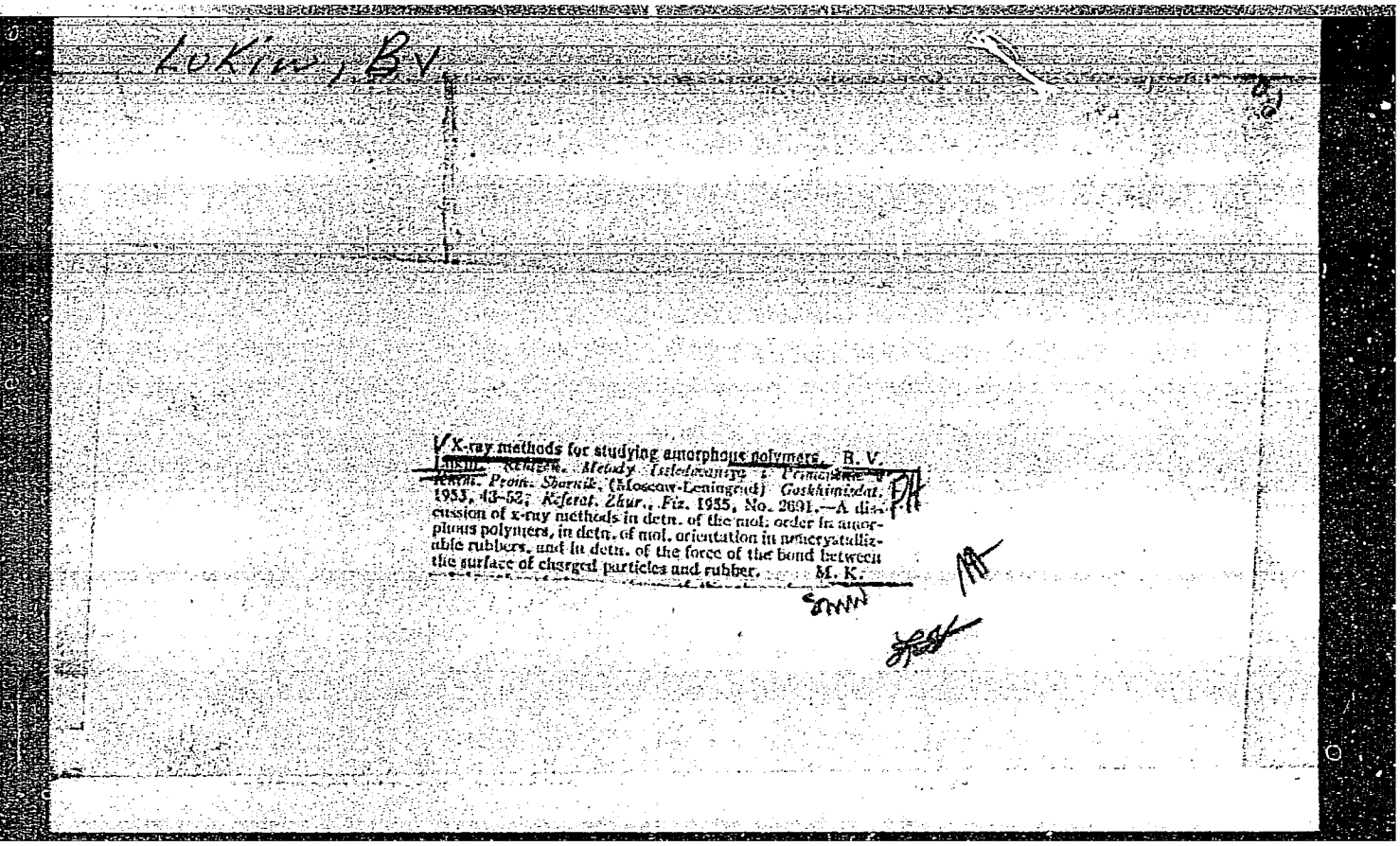
N. Thon

LUKIN, B. V.

(3)

X-ray investigation of the amorphous state of rubber. V. I. Kasatochkin and B. V. Lukin. *Khim. i Fiz.-Khim. Vysokomolekul. Soedinenii, Doklady 7-oi Konf. Vysokomolekul. Soedineniyam* 1952, 242–5; cf. *C.A.* 47, 1196d.—The amorphous scattering of rubber is due to 2 types of disorder, one usually found in gases, the other in liquids. Gases show scattering curves which increase strongly towards low angles, while liquids show a diffuse ring which depends on the av. mol. distances. Measurement of the amorphous scattering of rubber as a function of temp. shows a strong increase of the "gaseous" type of scattering with temp. Curves of scattering at 20, 80, and 120° are given and compared with the scattering of diethyl ether (Noll, *C.A.* 27, 1819). Prolonged treatment of rubber at high temps. (20 hrs. at 100°) causes an increase of 15–20% in "liquid" scattering. This is expected, since strong oxidation takes place and leads to stronger interchain interaction.

H. D. Noether



Lukin, B.V.

X-ray methods for studying amorphous polymers. B. V. Lukin. *Metody Issledovaniya i Primeneniye Polim. Sbornik.* (Moscow-Leningrad) *Goskhimizdat*, 1953, 43–52; *Referat. Zhur., Fiz.* 1955, No. 2691.—A discussion of x-ray methods in detn. of the mol. order in amorphous polymers, in detn. of mol. orientation in noncrystallizable rubbers, and in detn. of the force of the bond between the surface of charged particles and rubber. M. K.

KASATOCHKIN, V. I.: LUKIN, B. V.

Roentgenographic method of determination of molecular association in amorphic polymers. Izv. AN SSSR Ser. fiz. 17 no. 2:219-223 '53. (MLRA 6:8)

1. Institut goryuchikh iskopayemykh Akademii nauk SSSR.
(CA 47 no.22:11964 '53) (Polymers and polymerization)

LUKIN, B. V.

(3) Fuel

Fuel Abst.
Vol. 15 No. 4
Apr. 1954
Natural Solid Fuels:
Sources and Properties

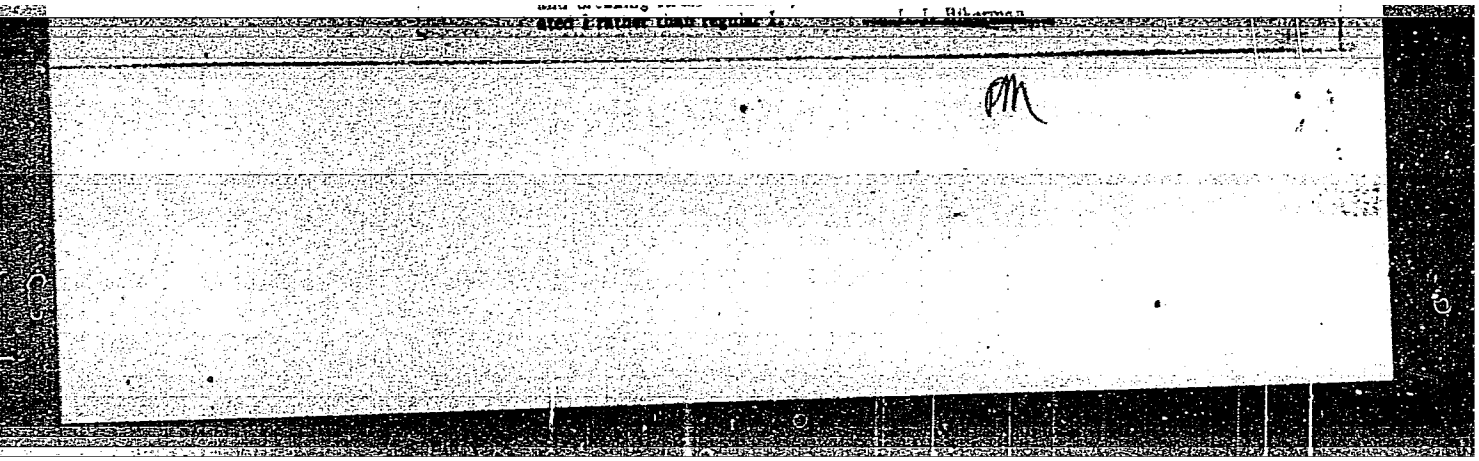
2737. ELECTRON MICROSCOPIC INVESTIGATION OF THE COMPONENTS OF COAL AND ANTHRACITE. Kasatochkin, V.I., Zolotarevskaya, E.Yu. and Lukin, B.V. (Izv. Akad. Nauk SSSR, Ser. Fiz. (Bull. Acad. Sci. U.S.S.R., Ser. Phys.), 1953, vol. 17, 246-248; abstr. in Chem. Abstr., 1953, vol. 47, 10941). In electron micrographs of anthracite, vitrain, fusain, humic acids, and coal black the bands with hkl indexes corresponding to "tilted" atomic planes of the graphite crystal lattice are absent. This indicates the absence of a three-dimensional order of carbon atoms and an amorphous character. Vitrain and anthracite are structurally anisotropic, whereas fusain, humic acid, and blacks are isotropic. Anthracite contains both vitrain and fusain. C.A.

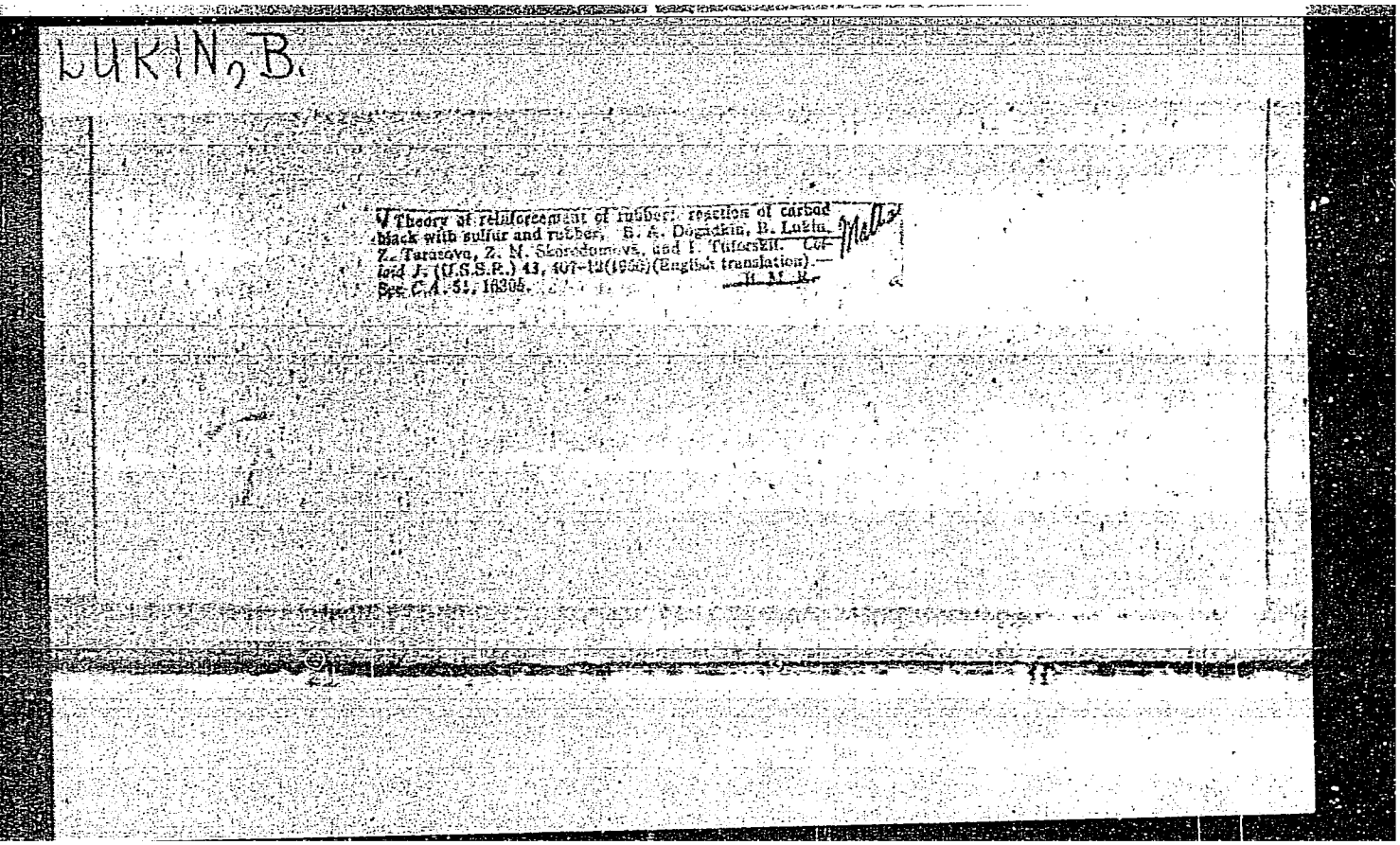
Lukin, B. V.

Theory of reinforcement of rubber: reaction of carbon black with sulfur and rubber. B. A. Dogadkin, B. Lukin, Z. Tarasova, Z. Skorodumova, and I. Tutorskii (Sci. Research Inst. Tire Ind., Moscow). *Kolloid. Zhur.* 18, 413-19(1956).—Channel black (I) heated with S (labeled with S^{35}) in toluene for 10 hrs. combined chemically with 0.04% and 0.28% S at 110° and 150°, resp.; the uptake of S was greater when an accelerator (a condensation product of AcH and PrCOH with $PhNH_2$) was also present and greatest when I was heated with H before heating with S. This hydrogenation lowered the O content of I from 4.4 to 2.1%. The aggregates of hydrogenated I were larger by about 20% than those of the original I. The percentage of Na butadiene

Maths

2 May





LUKIN, B.

Theory of reinforcement of rubber: reaction of carbon black with sulfur and rubber. B. A. Dogadkin, B. Lukin, Z. Tarasova, Z. M. Skorodumova, and I. Tiffenkil. Colloid J. (U.S.S.R.) 13, 407-12(1951)(English translation). See C.A. 51, 16305.

LUKIN, B.V.

AUTHORS: Lukin, B.V., Nagornyy, V.G. 32-12-27/71

TITLE: A Method for the Determination of the Closed Porosity and of Structural Defects (Metod opredeleniya zamknutoy poristosti i defektnosti struktury).

PERIODICAL: Zavodskaya Laboratoriya, 1957, Vol. 23, Nr 12, pp. 1458-1461 (USSR)

ABSTRACT: The present paper describes various kinds of structural defects and closed porosity, which are able to exercise considerable influence on the characteristics of metals. By closed porosity such a porosity is meant here as can be determined individually in a sample, in contrast to such as is usual in a material and is not taken into account in normal density numbers, although it often occupies up to 10% of the total volume. The here suggested new method is based upon a comparison of the results of two kinds of determining the specific weight of the samples: radiographical and pyknometrical methods of determination. For the first case, a number of suggestions is made in order to make the method more perfect, as e.g. in order to obtain sharper radiogram lines it is suggested that the thinnest possible samples be used, and in the other case it is recommended to apply small quantities of the sample on to a glass- or quartz thread, so

Card 1/2

A Method for the Determination of the Closed Porosity and of Structural Defects

32-12-27/71

that in the radiodiagram doubled lines of about 0.15 mm are obtained. The second method of determination consists in measuring the diameter of the rings (00 1) for the determination of the average periods according to the gravitational centers of mass of the cusps on the microphotograms (according to R.E. Franklin, Ref. 1). As decisive characteristic of the structural defects and closed porosity of the sample the divergence (D) of the results obtained by determining the specific weight according to both of the mentioned methods was considered, which is expressed by the following formula: $D = \frac{d_1 - d_2}{d_1} .100\%$. Results are shown in form of a diagram and a table. There are 2 figures, 2 tables, and 1 non-Slavic reference.

ASSOCIATION: Institute for Combustible Minerals AS USSR (Institut goryuchikh iskopayemykh Akademii nauk SSSR).

AVAILABLE: Library of Congress

Card 2/2 1. Metals-Characteristics

5(4) SOV/20-122-2-27/42

AUTHORS: Tikhomirova, N. N., Lukin, E. V., Razumova, L. L., Voyevodskiy, V. V., Corresponding Member, Academy of Sciences, USSR

TITLE: **Using Electron Paramagnetic Resonance and Roentgenography in Studying the Structure of the Carbonization Products Obtained From Carbon-Containing Substances**
(Issledovaniye stroyeniya produktov karbonizatsii uglerodsoderzhashchikh veshchestv metodom elektronnogo paramagnitnogo rezonansa i rentgenografiyey)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 122, Nr 2, pp 264-266 (USSR)

ABSTRACT: The method of paramagnetic electron resonance permits immediate detection of free radicals in the investigated system and a measurement of their concentration. In order to find the possibilities which are given by the investigation of the structure of carbonized substances by the method of paramagnetic electron resonance (and simultaneously by radiography), the authors investigated the structural variations caused by the carbonization of polyvinyl chloride

Card 1/3

Using Electron Paramagnetic Resonance and Roentgenography in Studying the Structure of the Carbonization Products Obtained From Carbon-Containing Substances

and polyvinylidenechloride. The carbonization was carried out in an inert atmosphere in the temperature interval of 350-700°C. The signal of the electron paramagnetic resonance (which indicates the existence of free radicals) appears in the first stages of the carbonization of polyvinyl chloride and polyvinylidenechloride (beginning with 350°). A diagram shows the variation of the signal width for the 2 investigated substances as a function of the carbonization temperature. A relatively wide line (7 Gauss) in polyvinyl chloride is an argument in favor of an essential influence of the hyperfine splitting up on hydrogen nuclei. Such great widths are characteristic of some natural coals. In the case of polyvinylidenechloride (especially in the initial stages of carbonization) the line of paramagnetic electron resonance is by far narrower than that of the product of the carbonization of polyvinyl chloride. According to radiographic data, an increase of the calcination temperature to 450° only slightly changes the character of the products of the carbonization of polyvinyl chloride. Other results are then discussed.

Using Electron Paramagnetic Resonance and Roentgenography in Studying the Structure of the Carbonization Products Obtained From Carbon-Containing Substances

According to these results, the appearing of a wide signal is connected with the existence of free valences near the individual carbon nets or blocks in which conduction electrons appear. There are 2 figures.

SUBMITTED: June 28, 1958

LUKIN, B.V.; CHERNIKOV, A.M.

Project of a Soviet academic expedition to South America; remarks on the history of Soviet - Latin American scientific ties. Vest. AN SSSR 33 no.7:101-103 Jl '63. (MIRA 16:8)
(Scientific expeditions)

KOMISSAROV, B.N. (Leningrad); LUKIN, B.V., (Leningrad)

Russian scientists in South America. Priroda 54 no.1:105-107 Ja '65. (MIRA 18:2)

LUKIN, B.V.; NAGORNYY, V.G.

Structure of calcined and graphitized cokes and their reactivity.
Konstr. uglegraf. mat. no.1:170-174 '64.
(MIRA 17:11)

L 24674-65 EWP(e)/EPA(s)-2/EWT(m)/EPF(c)/FCS/EWG(v)/EPR/EWP(j)/T/EWP(b)/EWA(1)
Pc-4/Pe-5/Pi-4/Pr-4/Ps-4/Pt-10 RM/WW

ACCESSION NR: AP5004687 S/0191/64/000/009/0013/0017

AUTHOR: Severov, A. A.; Gorbacheva, T. B.; Lukin, B. V.; Sergeyev, V. K.

TITLE: Changes in the fine and porous structures of phenol-formaldehyde resin during rapid short-duration heating to high temperatures

SOURCE: Plasticheskiye massy, no. 9, 1964, 13-17

TOPIC TAGS: phenolic plastic, polymerization, heat effect, crystal chemistry, polymer structure

Abstract: Changes in the structure of GOST 4559-49 phenol-formaldehyde resin have been studied during rapid short-duration heating up to 2900° C. The initial resin was cured for about 20 days at 160° C; its degree of polymerization was 98.2%. The specimens were heated at rates of 10,000—20,000° C/min. Heating was conducted in increments of 100° below 1100° C and 300° above 1100° C, with a 1-min holding time at each temperature. The samples were then cooled in nitrogen. Changes in the porous structure of the specimens were studied by visual observation, micrographs, and porosity measurements based on moisture absorption. In addition, weight loss, shrinkage, and compressive

Card 1/6

strength of the specimens were determined. The results of the study are given in the form of micrographs and plots of porosity and weight versus temperature (see Fig. 1) and shrinkage and strength versus temperature (see Fig. 2).

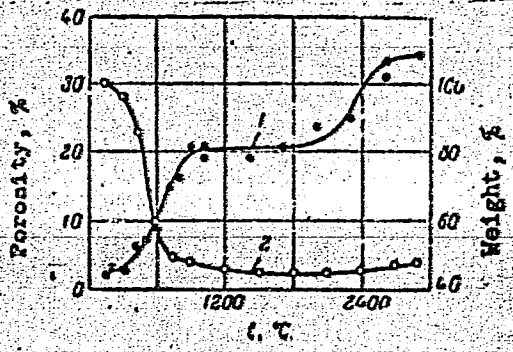


Fig. 1. Dependence of porosity (1) and weight (2) of phenol-formaldehyde resin on heating temperature.

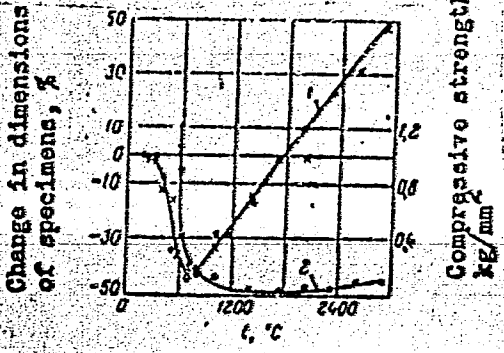


Fig. 2. Dependence of shrinkage (1) and strength of specimens of phenol-formaldehyde resin on the heating temperature

The results showed that: 1) Pores and cracks develop rapidly at 400—700° C as a result of the evolution of volatile pyrolysis products. The process causes considerable weight loss and shrinkage of specimens. 2) The pores continue to develop at 700—1300° C, but at a slower rate. At the same time wide cracks are formed. These cracks cannot be determined by moisture absorption, and the magnitude of the measured porosity remains unchanged up to 1900° C. 3) At 1900—2600° C, the pores continue to develop; since specimen weight remains unchanged, it is concluded that the porosity develops as a result of an increase in the density of the coke pore walls. 4) At 2600—2900° C, the pores become filled with secondary products formed by pyrolysis-product decomposition. The specimens become blocks and acquire a metallic luster, and their weight increases slightly. 5) The specimen volume increases continuously at above 700° C and attains 150% of its initial value at 2900° C. 6) The specimen compressive strength drops from its initial value of 700—2100 kg/mm^2 to 0.05 kg/mm^2 at 1700—2600° C, and then increases again at 2900° C to 0.10 kg/mm^2 owing to the deposition of secondary products which fill the pores and cracks.

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001030810008-0"

The fine structure of the resin was studied by the x-ray diffraction method. The results of the study are given in the form of x-ray diffraction patterns and in the form of changes of the diffusion ring width and of interplanar spacings in the c-axis direction with temperature (see Fig. 3).

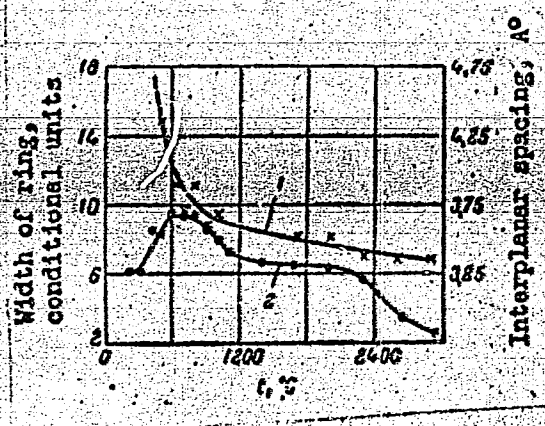


Fig. 3. Dependence of interplanar spacing and width of diffusion ring on temperature:

1) Intermolecular distance and interplanar spacing; 2) width of the diffusion ring.

These results show that: 1) Heating of the resin to 250° C causes its further polymerization. 2) At 300—700° C, the resin degrades and coke structures are formed. 3) Above 800° C, the formation of primary and the ordering of secondary coke structures (bundles) continues; the two-dimensional coke-structure formation ends at 1200—1300° C. 4) At 1200—2300° C, slow growth of bundles continues. 5) At higher temperatures, in the pregraphitization period, the bundles begin to grow more rapidly; regions with a three-dimensional ordering (crystallites of graphite) appear at 2900° C. Thus during rapid heating graphitization begins at higher temperatures than during heating at a rate of 10° C/min with 2-hr holding periods, in which case graphitization begins at 2400° C.

COMMENT: The article is interesting as an apparent attempt to determine the character and possibly the rate of progressive thermal deterioration of a GRP binder at temperatures and heating rates comparable to those arising in missile combustion chambers or on the surface of re-entry plates. At the given heating rate, i.e., 170-330 C/sec, testing temperatures of 400-2900°C could be reached within the time required to reproduce approximately the thermal conditions to which GRP used for aerospace purposes is subjected. It is true that only the binder and not the GRP itself was tested, and that heat transfer was not

L 24674-65

ACCESSION NR: AP5004687

studied in this series of experiments. However, a knowledge of the charcter of the degradation of the least resistant component is essential for further research. The low compressive-strength values obtained for the coke specimens may be of importance in evaluating the crumbling of coked material which serves as a shield for the plastic which is still intact.

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: MT, TD

NO REF SOV: 003 OTHER: 002 FSB v.1, no.1

Card 6/6

L 31335-65 EWG(j)/EWP(e)/EPA(s)-2/EWT(m)/EPF(c)/EPF(n)-2/EWG(m)/EPR/T/EWP(t)/EPA(bb)-2
EWP(b) Pz-4/Ps-4/Pt-10/Pu-4 IJP(c) RMH/JD/WW/JG/AT/RM

ACCESSION NR: AP5006481 S/0294/65/003/001/0169/0170 81

66

AUTHOR: Lukin, B. V.; Tarabanov, A. S.

TITLE: First all-union scientific and technical conference on silicon carbide

SOURCE: Teplofizika vysokikh temperatur, v. 3, no. 1, 1965, 169-170

TOPIC TAGS: metallurgic conference, silicon compound, carbide, crystal, high temperature metal, refractory

ABSTRACT: The First All-Union Scientific and Technical Conference on Silicon Carbide was held 27--30 October 1964 at the Institute of Materials Science of the Ukrainian Academy of Sciences. About 180 people representing

various organizations attended the presentation of [illegible]

structure, properties, and applications of silicon carbide.

I. N. Frantsevich, V. V. Pasynkov, L. V. Ryzhikov, and others treated general problems. In the subsequent discussion, the demand for new silicon carbide-base construction materials and high-purity silicon carbide crystals was revealed. It was pointed out that the demand for silicon carbide materials considerably exceeds their production in the SSSR.

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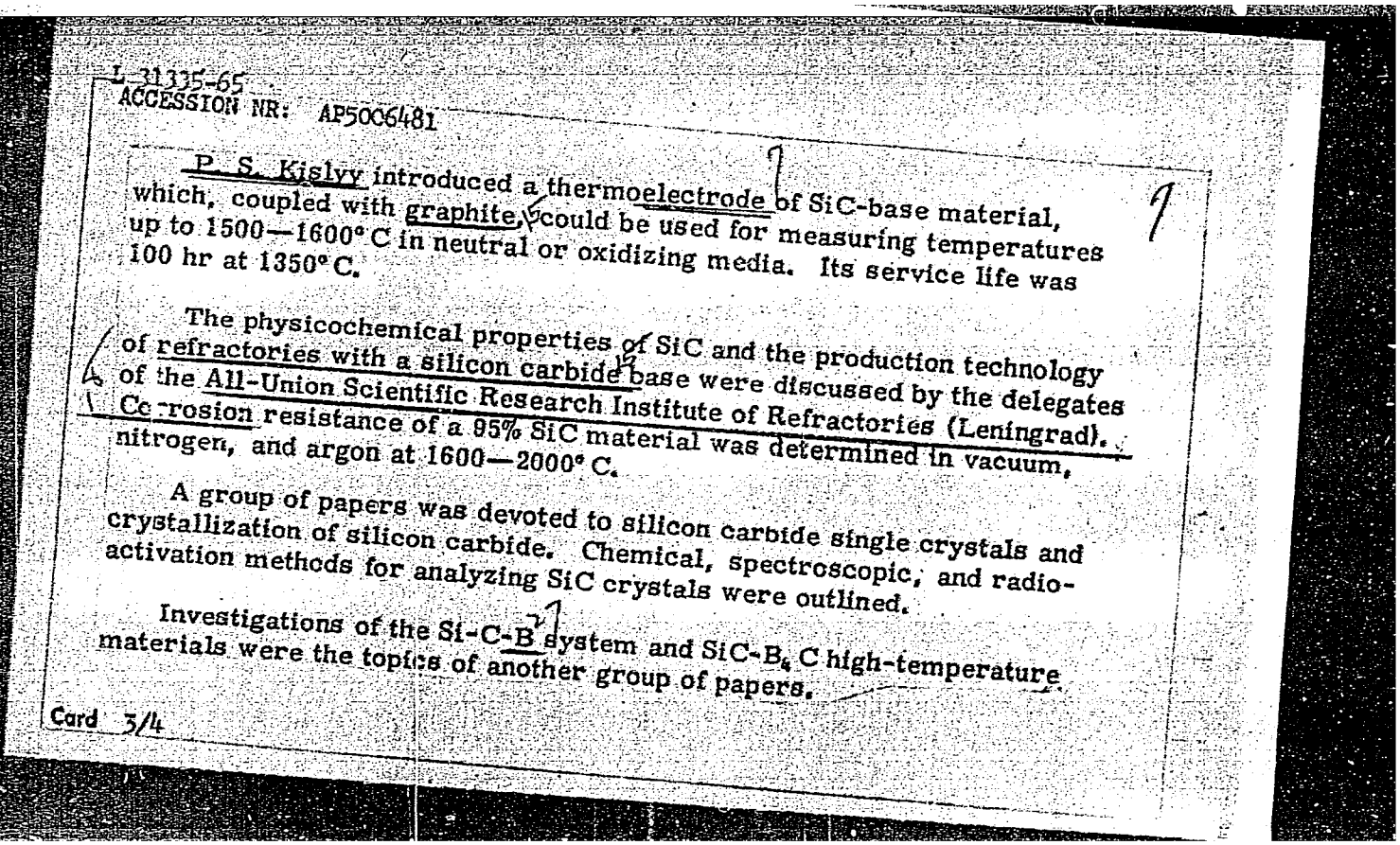
ACCESSION NR: AP5006481

I. N. Frantsevich, G. G. Gnesin, and others discussed high-temperature properties and applications of silicon carbide. The thermal and physical properties of the best material, which was produced by reactive sintering of 85% SiC with 15% petroleum coke, were determined. Heating elements made of the material withstood 1580—1600° C for 450—500 hr in air and resisted molten Cu, Zn, and Si.

T. Ya. Kosolapova and G. A. Yasinskaya examined the refractory and chemical properties of silicon carbide. They established that silicon carbide readily reacted with oxygen (air), water vapor, and MgO at 1700° C. Temperatures of the initial reaction were 1000° C with MgO, 1300° C with Cr_2O_3, 1400° C with ZrO_2, 1500° C with corundum, and 1700° C with BeO. Niobium and molybdenum form $NbSi_2$ and $MoSi_2$ at 1300° C. Bismuth and sodium react with SiC at 1000° C and 900° C, respectively. Silicon carbide is not wetted by molten Zn, Pb, or Cd. Refractory SiC-Si-Si_3N_4 material was used for making thermocouple wells for 100 hr service at 1000° C max.

Card 2/4



L 31335-65
ACCESSION NR: AP5006481

P. S. Kislyy introduced a thermoelectrode of SiC-base material, which, coupled with graphite, could be used for measuring temperatures up to 1500—1600° C in neutral or oxidizing media. Its service life was 100 hr at 1350° C.

The physicochemical properties of SiC and the production technology of refractories with a silicon carbide base were discussed by the delegates of the All-Union Scientific Research Institute of Refractories (Leningrad). Corrosion resistance of a 95% SiC material was determined in vacuum, nitrogen, and argon at 1600—2000° C.

A group of papers was devoted to silicon carbide single crystals and crystallization of silicon carbide. Chemical, spectroscopic, and radioactivation methods for analyzing SiC crystals were outlined.

Investigations of the Si-C-B system and SiC-B_4C high-temperature materials were the topics of another group of papers.

Card 3/4

L 31335-65

ACCESSION NR: AP5006481

Experimental data on the stability of materials with silicon carbide base in pilot-plant service and problems of production were presented in several papers.

The proceedings of the Conference are to be published in 1965.

ASSOCIATION: none

SUBMITTED: 00	ENCL: 00	SUB CODE: IC, MT
NO REF SOV: 000	OTHER: 000	ATD PRESS: 3198-F

Card 4/4

SEVEROV, A.A.; GORBACHEVA, T.B.; LUKIN, B.V.; SERGEYEV, V.K.

Changes of the thin and porous structures of phenol-formaldehyde resins at high-speed, short-term high-temperature heating. Plast. massy no.9:13-17 '64. (MIRA 17:10)

LUKIN, B.V.; TARABANOV, A.S.

First All-Union Scientific Conference on the Technology of Silicon Carbide. Teplofiz. vys. temp. 3 no.1:169-170 Ja-F '65.
(MIRA 18:4)

LUKIN, B.V.

On the history of Russian explorations in Latin America; the 50th anniversary of the 1914-1915 expedition. Izv. Vses. geog. ob-va 97 no.1:70-75 Ja-F '65. (MIRA 18:3)

LUKIN, D., gvardii podpolkovnik

Military work in the name of our motherland. Voen.vest. 43 no.11: 46-54 N '63. (MIRA 16:12)

LUKIN, D.A.

SUKONSHCHIKOVA, A.A.; LUKIN, D. A.

Indirect roentgenotherapy of unveal tuberculosis. Vest. oft., Moskva 31 no. 4:19-23 July-Aug. 1952. (CLML 22:5)

1. Candidates Medical Sciences. 2. Of Leningrad Scientific-Research Institute for Eye Diseases imeni L. L. Girshman.

LUKIN, D.A., starshiy nauchnyy sotrudnik kandidat meditsinskikh nauk.

Teleroentgenotherapy of skin diseases. Vest.ven.i derm. no.5:17-20 S-O '53. (MLRA 6:12)

1. Iz Voyenno-meditsinskoy akademii im. S.M.Kirova.
(Radiotherapy) (Skin--Diseases)

LUKIN, D.A.; MURATKHODZHAYEV, N.K.; SAVINA, A.A.

Treatment of chronic eczemas and neurodermatitis with Sr^{90}.
Med. rad. 5 no.11:7-11 N '60. (MIRA 13:12)
(STRONTIUM--ISOTOPES) (ECZEMA)
(SKIN--DISEASES--PSYCHOSOMATIC ASPECTS)

L 22871-66 EWT(d)/FSS-2/EWT(1)/EEC(k)-2/FCC/EWA(d)/EWA(h) AST/TT/RB/GW/WS-2

ACC NR: AP6012828 SOURCE CODE: UR/0293/66/004/002/0238/0241

AUTHOR: Kazantsev, A. N.; Lukin, D. S.

ORG: none

TITLE: Field intensity of short radio waves emitted by an artificial earth satellite

SOURCE: Kosmicheskiye issledovaniya, v. 4, no. 2, 1966, 238-241

TOPIC TAGS: radio communication, satellite communication, radio wave propagation

ABSTRACT: A study is made of the dependence of the field intensity of short radio waves emitted by an artificial earth satellite on distance under various propagation conditions and parameters of the ionosphere. Formulas are derived for calculating the focusing factor for the emission (without consideration of the magnetic field) and for the total absorption coefficient factor for the radio beam path. The Strela-M computer was used for the calculations. Some results are shown in the figure. The curves show the upper and lower

Card 1/2 UDC: 621.371

L 22871-66

ACC NR: AP6012828

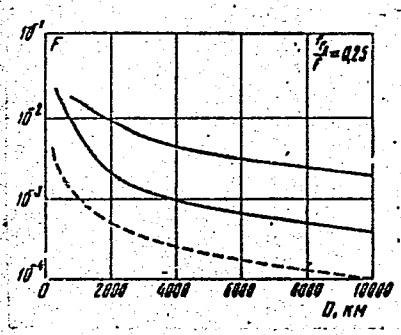


Fig. 1. Dependence of field intensity on distance

_____ Focusing factor taken into account
---- According to 1/D.

limits of the field intensity for various angles of the beam output. For the case of reflection from the ionosphere only, the field intensity decreases slower than 1/D. Orig. art. has: 3 figures and 12 formulas. [GS]

SUB CODE: 17/ SUBM DATE: 23Jul65/ ORIG REF: 004/ ATD PRESS: 4234

Card 2/2 LC

L 24831-66 EWT(d)/FSS-2/EWT(l)/EWT(m)/EWP(w)/EEC(k)-2/FCC/EWP(v)/T-2/EWP(k)/
EWA(h)/ETC(m)-6 IJP(c) AST/EM/GW

ACC NR: AP6012827 SOURCE CODE: UR/0293/66/004/002/0221/0237

80
B

AUTHOR: Kazantsev, A. N.; Lukin, D. S.

ORG: none

TITLE: Mechanism of the radio-wave propagation from artificial earth satellites

4 26

SOURCE: Kosmicheskiye issledovaniya, v. 4, no. 2, 1966, 221-237

TOPIC TAGS: radio wave propagation, magnetic field, ionosphere, artificial satellite

ABSTRACT: The mechanism of radio-wave propagation from artificial earth satellites has been investigated (without taking into consideration the magnetic field and collisions), based on the calculation of the radio-wave trajectory in a heterogeneous ionosphere, a hose electron concentration arbitrarily changes according to two coordinates. Calculations are made of ray trajectories in a spherical layered ionosphere in the absence and in the presence of a horizontal gradient. It was shown that in the case of a spherical layered ionosphere, there are two mechanisms of radio-wave propagation, namely, consecutive reflections from the ionosphere and from the earth's surface and consecutive reflections from the ionosphere only. The presence of the horizontal gradient of the electron concentration substantially affects the wave propagation (ionosphere -- ionosphere) and leads to the arrival of radiation on the earth from artificial earth satellites at distances of 4,000 to 6,000 km.

Card 1/2 UDC: 621.371

L 24833-66
ACC NR: AP6012827

The time of the signal propagation is compared with the experimental data according to the round-the-world echo. Orig. art. has: 14 figures and 28 formulas. [NT]

SUB CODE: 03/ SUBM DATE: 23Jul65/ ORIG REF: 005/ OTH REF: 001/

Card 2/2 dda

ACCESSION NR: AP4006839 S/0120/63/000/006/0173/0174

AUTHOR: Lukin, E. A.; Shitikov, B. I.

TITLE: Transistorized broadband pulse generator

SOURCE: Pribory* i tekhnika eksperimenta, no. 6, 1963, 173-174

TOPIC TAGS: broadband pulse generator, transistorized pulse generator, pulse generator, low-impedance pulse generator, digital computer, testing, pulse oscillator

ABSTRACT: A pulse generator is described which consists of a master multivibrator, a starting-pulse shaper, an output-pulse shaper (one-shot multivibrator), an amplifier, an amplifier-phase-inverter, and an emitter-type output repeater. The master multivibrator can operate in any of the ten bands: 3, 2, 1 mc, 500, 250, 100, 50, 20, 1 kc, and 20 cps. The shaped-pulse duration is 0.1 microsec. The output-pulse shaper produces pulses of from 0.2 microsec to

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ACCESSION NR: AP4006839

10 millisec. The output impedance is 5 ohms; output pulse power, 18 w; the output-pulse amplitude can be varied gradually from 0 to ± 18 v. The instrument is intended for aligning digital computers and other pulsed devices. Orig. art. has: 1 figure.

ASSOCIATION: none

SUBMITTED: 11Jan63	DATE ACQ: 24Jan64	ENCL: 00
SUB CODE: SD	NO REF SOV: 001	OTHER: 000

Card 2/2

L 1949-66 FBD/EWT(1) GW/WS-2

ACCESSION NR: AP5020672 UR/0033/65/042/004/0705/0708
523.164.42

AUTHOR: Lastochkin, V. P.; Lukin, E. B.; Stankevich, K. S.; Tseytlin, N. M.

TITLE: Using lunar occultations to study the Crab Nebula

SOURCE: Astronomicheskiy zhurnal, v. 42, no. 4, 1965, 705-708

TOPIC TAGS: radio astronomy, nebula, lunar phenomenon

ABSTRACT: During lunar occultation of a discrete source, the radio waves emitted by the source are diffracted by the surface of the moon, and an observer on the earth sees a distribution of intensities which corresponds to the Fresnel diffraction region. An occultation can be considered as a diffraction on the edge of an infinite half-screen. The width of the interference bands generated by superposition of the direct rays and those reflected from the spherical lunar surface, in a plane perpendicular to the incident rays and passing through the center of the moon, being

$$\delta = \frac{3}{2} a \left(\frac{\lambda}{4a}\right)^{1/3}$$

(where a is the radius of the moon), is smaller by a factor of 10^2-10^3 than

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ACCESSION NR: AP5020672

the first Fresnel zone $\sqrt{\lambda R}$ (R is the distance to the moon), and consequently the average distribution of the field cannot be altered by possible interference effects. Experimental data on the distribution of intensity during occultations of a source with extremely small angular dimensions agree well with the diffraction pattern of an infinite half-screen. Ordinarily, the antenna is directed toward the discrete source during observation of an occultation, so that the moon is a moving screen. If temperature changes in the antenna due to passage of the moon through the radiation pattern during occultation of the source are disregarded, then the antenna temperature is proportional to:

$$T_A \sim \int_{-\infty}^{\infty}\int F(\theta, \varphi)T(\theta, \varphi)I(\theta - x, \varphi)\,d\theta\,d\varphi,$$

where the θ axis is along the direction of motion of the source, $F(\theta, \phi)$ is the antenna pattern, $T(\theta, \phi)$ is the distribution of brightness from the source, and $I(\theta - x, \phi)$ is the distribution of intensity from a point source for the case of diffraction on the edge of an infinite half-screen.

$$I(\theta - x) = \left\{C\left[(\theta - x)\sqrt{\frac{\pi R}{\lambda}}\right] + \frac{1}{2}\right\}^2 + \left\{S\left[(\theta - x)\sqrt{\frac{\pi R}{\lambda}}\right] + \frac{1}{2}\right\}^2$$

L 1940-66

ACCESSION NR: AP5020672

and

$$C(w)=\sqrt{\frac{2}{\pi}}\int_0^w \cos\eta^2 d\eta \quad \text{и} \quad S(w)=\sqrt{\frac{2}{\pi}}\int_0^w \sin\eta^2 d\eta$$

10

are Fresnel integrals. It is shown that diffraction effects should be taken into account in the reduction of occultation curves even when the source is extended. Three occultations of the Crab Nebula by the moon were observed at 535, 189, and 412 Mc. These occultations were used to obtain data on the angular dimensions of the nebula and on the shift of the effective emission center. The position of the emission center for the nebula is given in Table 1 of the Enclosure, where α and δ are given for points of the source located on the intersection of the source direction of motion with the edge of the lunar disk. "The authors are sincerely grateful to A. G. Kuntsevich and V. S. Lazarevskiy for making the astronomical calculations, and to O. N. Shipule and G. N. Nikulin for help in making the measurements." Orig. art. has: 4 figures, 6 formulas, 1 table. [14]

ASSOCIATION: Radiofizicheskiy institut Gor'kovskogo gos. universiteta (Radiophysics Institute, Gorky State University)

55

SUBMITTED: 22Dec64 ENCL: 01 SUB CODE: AA

NO REF SOV: 002 OTHER: 005 ATD PRESS: 4115

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L 1940-66

ACCESSION NR: AP5020672 ENCLOSURE: 01

Table 1.

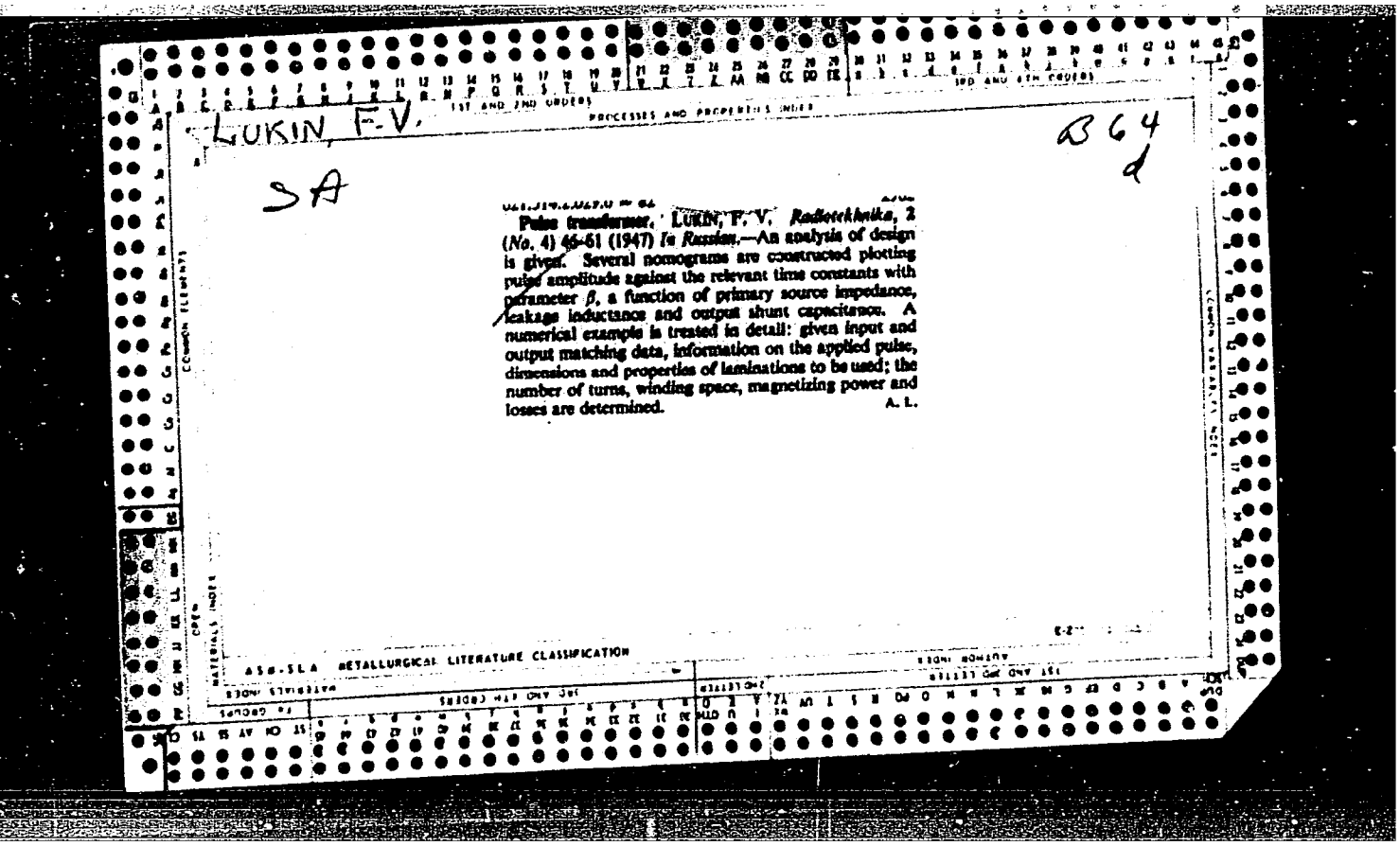
Frequency, Mc	Transit time of the edge of the moon through the center of the source	α (1950)	Δα	δ (1950)	Angular diameter	Positional occultation angle
535	18^h59^m9	$5^h31^m30^s9$	$\pm0.2^s$	21°59!4	5.5'	74°
535	20^h07^m3	$5^h31^m20^s3$	$\pm0.2^s$	21°59!3	5.5'	278°
180	14^h03^m5	$5^h31^m31^s4$	$\pm0.4^s$	21°59!4	5.5'	108°
180	15^h07^m0	$5^h31^m29^s6$	$\pm0.45^s$	21°59!3	6'	236°
412	-	-	-	-	6'	127°

Card 4/4

LUKIN, F.F.

Animal husbandry specialist with broad training. Zhivotnovodstvo 20 no.9:84 S '58. (MIRA 11:10)

1. Zamestitel' direktora po uchebnoy chasti Novocherkasskogo zoo-vettekhnikuma.
(Stock and stockbreeding--Study and teaching)



LUKIN, F.V.

SA

B64
d

Pulse transformer. LUKIN, F. V. *Radiotekhnika*, 2 (*No.* 4) 46-61 (1947) *In Russian.*—An analysis of design is given. Several nomograms are constructed plotting pulse amplitude against the relevant time constants with parameter β, a function of primary source impedance, leakage inductance and output shunt capacitance. A numerical example is treated in detail: given input and output matching data, information on the applied pulse, dimensions and properties of laminations to be used; the number of turns, winding space, magnetizing power and losses are determined. A. L.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION